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TRANSACTIONS

OF THE

Ottawa Literary and Scientific Society

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TRANSACTIONS

OF THE

Ottawa Literary & Scientific Society.

INTRODUCTION.

In issuing the first publication of the Ottawa Literary and Scientific Society a few words are necessary :—

The position occupied by the Society in the community is unique, and its development is bound up in the history of Ottawa (formerly Bytown.)

Up to the present the city of Ottawa is without a public library, a regrettable fact which, it is hoped, may be remedied soon ; and the Society, therefore, from its inception felt the necessity of endeavoring to supply the place of that much needed institution.

Passing over the historical part which will be given later, and considering the Society of recent years, it is desirable to state that, besides providing a library and reading room, it has annually furnished a course of lectures.

These lectures, while of a popular nature, in many cases embodied original work, and for the presentation of such work this publication is intended, the Society considering that in this matter it has a duty to perform,—to add its mite to the world's fund of knowledge, upon which we all so freely draw.

Heretofore the course has not been arranged with the especial object of furnishing material for publication, and hence our present issue may probably be regarded as somewhat meagre. However, it is hoped that hereafter, annually, more material will be available and a more extensive publication issued.

It may perhaps be interesting to give the last course of lectures:

1897-8.

Nov. 12.—Fridtjof Nansen, - - - "North Pole."
" 19.—B. Sulte, - - "The Meaning of Ottawa."
" 19 { A. Lampman, - - - - - - Reading
" { W. J. Sykes, "Plea for higher type of literature."
(Literary and Musical Evening.)
Dec. 3.—George Johnson, - "Place names of Canada."
" 17.—Professor S. W. Dyde, - "Paradise Lost."
Jan. 7.—Rev. Dr. J. B. Saunders, - - "Anthropology."
" 21.—Joseph Pope, - - - "Samuel Pepys."
Feb. 1.—J. M. Macoun, - - - "The Fur Seal."
" 18.—Wm. Ogilvie, "The Yukon and its gold resources."
Mar. 1.—Thos. Macfarlane, "The utilization of moss lands."

As the range of the publication now initiated covers the whole field of science there is no reason why it should not become the medium for the record of much of the original work carried on by the scientific branches of the government, which otherwise might not see the light of day.

When the library of the Society is established upon its proper basis, it will probably become one more for reference than for general reading.

That social element, the attrition of thought and intellect by intercourse among the members, requires fostering, for neither the library nor the reading-room affords such opportunity. Thinking men without some social tie are starved intellectually.

We may perhaps hope that in future it may be possible to have two courses of lectures, one of a popular nature, the other more technical.

Historical Sketch.

(Compiled from the minute books of the Society.)

—

Bytown Mechanics' Institute.

"At a meeting, called by public notice, held in the Oddfellow's Hall, (Chaudiere Lodge), 20th January, 1847, in order to form a Mechanics' Institute, and at which a lecture on the "Importance of knowledge to the working classes" was delivered by the Rev. James T. Byrne:—

1st. It was resolved—That it is expedient to form a Mechanics' Institute.

2nd. It was resolved—That a committee be now appointed to frame a constitution, aud that the following persons comprise that committee, viz:—Messrs. Henry Bishoprick, Horatio Blaisdell, Edward Campbell, William Bowles, Francis Thomson, Michael McDermott, Rev. Mr. Wilson, Rev. Mr. Byrne, Elkanah Billings, James Mathews and William Harris, and that seven do form a quorum for the transaction of business.

3rd. It was resolved—That the annual subscription be not less than five shillings.

4th. It was resolved—That the admission of apprentices be left with the committee.

5th. It was resolved—That a subscription list be now opened to receive necessary subscriptions to the Institute.

On Feb. 17th, 1857, a constitution was presented and adopted. Immediately thereafter the election of the first officers of this embryo organization for the diffusion of knowledge in Bytown took place. And it was resolved that all the resident clergymen of Bytown be honorary members of the Institute.

It was resolved (March 5, 1847) that the room (Oddfellows' Hall) be opened every Saturday evening from seven to ten o'clock for the purpose of allowing members to read and exchange books.

On the evening of the above date the Rev. Mr. Byrne delivered a lecture on "Female Education." We see that at early date this subject, which has so wonderfully developed and taken so practical a form in our day, had already occupied and enlisted the serious attention of thinking men.

On April 2, 1857 the Rev. Mr. Durie gave a lecture on "Phenomena of the atmosphere."

On April 9, 1847, it was resolved—That Mr. Robert Hill be appointed Librarian, and that he be paid one shilling and sixpence for each night the room is occupied by the Mechanics' Institute, and that he provide fire whenever required, and also keep the books and accounts thereof, as well as the room in proper order."

From this it would appear as if the Librarian had to furnish the wood himself. However, the market price of fuel was very low at that time.

The first magazines secured for the Institute were "Hunt's Merchants' Magazine, The Eclectic Magazine, and Silliman's Journal."

The first donation of money for the Institute was given on April 16, 1857, by Stewart Derbishire* and amounted to £65 currency ($260).

One of the first purchases of books was that of the 22 volumes of the Encyclopedia Britannica, 7th edition, for £25 currency.

On August 6, 1847, "It was resolved—That the books of the Library taken out by members for the purpose of reading be returned to the Library in two weeks from the time they were taken, and the parties neglecting to comply shall be fined sixpence for the first week, one shilling for the second, two shillings for the third, and doubled every week it may be kept after the period for its return."

This was undoubtedly dealing in heroic measures. An unfortunate member retaining a book—say ten weeks—over time would be liable for more than £25!

*Mr. Derbishire filled the office of Queen's Printer for many years under the old government of Canada.

On Nov. 8, 1847, the Mechanics' Institute rented "the basement story of the Congregational Church on lot 28 on Sparks street, near Sappers' Bridge," at twelve pounds ten shillings per annum, for two nights in the week. (This is the place where the Journal office now stands.)

In the minutes of March 14, 1848 we read: It was resolved—That Messrs. Hervey, Main and Lett be a committee to prepare a petition to the Provincial Parliament for aid to the Institute, and that John Scott, Esq., M.P.P. for Bytown, be respectfully requested to present the same. It is also recorded that "the secretary reported the receipt of a portrait of the Queen, donated from Christopher Armstrong, Esq., Judge of the Dalhousie District Court, which was ordered to be framed with black walnut."

This picture is still in possession of the Society.

On the same date is entered: "It was resolved—That a soiree in connection with the Institute be held on Wednesday evening, 22nd inst. Admittance to be by ticket; single tickets two shillings and sixpence, double tickets, three shillings and nine pence."

For this social gathering under the auspices of the Institute Mr. Francis Thomson agreed to furnish "tea, coffee, pastry and refreshments at one shilling nine pence each ticket."

"It was resolved—That tea be on the table ready to commence at seven o'clock." As a soiree this first entertainment may have been a success, but financially the secretary reported a "deficiency of five pounds sixteen shillings, and seven pence, for which J. B. Lewis, Esq., had undertaken to make good such deficiency whenever called upon to do so."

From the Treasurer's accounts it would appear that tallow candles were used in the rooms of the Institute.

There are no entries in the minute book after 1849, from which it appears that the first Mechanics' Institute became defunct in that year.

Bytown Mechanics' Institute and Athenaeum.

In January, 1853, a public meeting was called "for the purpose of taking measures to re-organize this highly important Institution." At this meeting Judge Armstrong presided, Elkanah Billings acting as Secretary, and a provisional

committee was formed, which shortly afterwards issued a prospectus in which is found :—"It is a matter within the knowledge of all and it is deeply to be regretted, that, although Bytown contains a population of 8,000 souls and is one of the most wealthy and flourishing commercial towns of the Province with respect to its facilities for diffusing useful information, it is far behind most other places of equal note in the country. While all other large towns of Canada, and even many of the small villages in the new settlements, can boast each of its Debating Club, Circulating Library or Mechanics' Institute, no Association of an intellectual character, not even a Reading Room exists in a place that will in all probability, within a very short period, be elevated to the dignity of a city. This deficiency, while it deprives the adult members of the community of all those pure mental enjoyments that flow from the cultivation of the mind, either by reading, or by listening to discourses on literature, science or art, is when viewed with reference to its influence upon the youth of the town productive of consequences of a much more painful and destructive nature. . . . . As there is no public library from which well selected books upon different branches of science can be procured, and as no provision whatsoever has been made for the delivery of instructive lectures, it is difficult to perceive how a young man can obtain knowledge in this town, either by reading for himself, or by having it imparted to him by others. . . . . Between the time of leaving the Common School and that period of life, when the full age of discretion is arrived at, there are from five to ten years during which the character of the future man is formed, and during which the greater portion of the knowledge that is to serve him through life is to be acquired. If a store of general information is not laid up in this period the individual must pass through existence without it. When the cares of business and the struggle for subsistence commence, the time for education is past, and he who has not obtained it before, will most likely never possess it.

In this prospectus, which commands our admiration, an appeal was made to the citizens for subscriptions and as a result £130 7s. 6d. were collected, thereby founding the Bytown Mechanics' Institute and Athenæum on January 29th, 1853, of which the present Ottawa Literary and Scientific Society is a direct descendent.

Towards the Institute the Government made a grant of £50.

The annual fees levied were on a graded scale; for Mechanics 5 shillings, for Clerks 10 shillings, and for Merchants 20 shillings. Lectures were delivered in the Temperance Hall, formerly Congregational Church, already alluded to. It is related that one Scotch divine expounded some theological subject for six hours, from 7 p.m. to 1 a.m.—and without any respite—"between the acts." On another occasion "The Geography of Canada" occupied the lecturer four hours. It was perhaps fortunate for the audience that Canada was not then more fully explored.

During the summer of 1853, the Governor-General, Lord Elgin, visited Bytown, and, besides the reception tendered to him by the Institute, an exhibition was held. In commemoration of both events the Committee issued through the Ottawa "Citizen" the following address. It was got up in the best style of the printer's art,—letters, ornamentation, coat-of-arms, everything in gilt.

VIVAT REGINA.

1853.
Knowledge
is Power.

1853
Bytown
Industrial Exhibition.

OTTAWA CITIZEN.

Amongst the many Agencies employed for the advancement of our race

Exhibitions of Natural & Industrial Productions of Countries,

ARE PECULIARLY CHARACTERISTIC OF THE TIMES;

And it is pleasing to observe that in Diffusing Useful Knowledge, and inducing General and Permanent Benefits, they are eminently successful.

Prompted by a laudable feeling, the Committee of the **BYTOWN MECHANICS INSTITUTE AND ATHENAEUM** *determined to improve the occasion of* **the Visit to Bytown of His Excellency Lord Elgin, Governor General of British North America,** *to have an Exhibition of*

The Products of the Ottawa Country.

However humble such an Exhibition may appear, when compared with those to which all the nations of the Earth are contributors, it is not the less valuable, nor are those who are instrumental in its creation the less entitled to credit.

The occasion of the visit to this place of His Excellency LORD ELGIN, who is distinguished for learning and talents and for the interest taken by him in such Exhibitions, and in Science and Industry, has been most appropriately and happily chosen: and while the Exhibition will not be without interest to the Noble Visitor and other strangers, the visit will be characterised by this pleasing feature, and be identified with the

Industrial Progress of our Country.

In accomplishing the great object of this and similar Exhibitions, and all kindred efforts in the same cause,

The Press takes it's place as a Co-worker in the Field

It labours in the improvement of Arts, and the Arts gratefully repay by increasing its capabilities and power,—thus presenting an example of most important mutual benefits, resulting from

GENEROUS PURPOSES AND UNITED EXERTIONS.

Bytown, July, 1853.

Coat of Arms,
Town Council of the
Town of Bytown.

View of the Locks on the Rideau Canal at Bytown, at its entrance from the Ottawa.

Coat of Arms,
Town Council of the
Town of Bytown.

Of the original members of the Institute there are now living only the Hon. R. W. Scott, George Hay and C. R. Cunningham.

In those early days candles were used, for on August 2nd, 1854, it is found recorded that a conversation took place on "the best means of furnishing the rooms with oil."

In the annual report for 1854 we find that "the present flourishing state of the Institute is chiefly due—and acknowledged with pleasure by the Committee to be due—" to the cordial and generous co-operation and assistance of those ladies, who, on this occasion as on all others, have been the foremost in lending the most active and successful aid in promoting the best interests of the community; and from the proceeds of a bazaar held in the end of October, presented to the Institute a munificent donation of £200 6s. 6½d. To these ladies the Committee cannot adequately express the grateful sense which it entertains of their noble exertions and the magnificent result of these exertions for the Institute."

The Institute took active steps for building up a Museum, and in 1855 offered the following prizes :—

Best collection		Coleoptera and Hemiptera.....	£2 10s.
"	"	Lepidoptera and Neuroptera.....	2 10s.
"	"	Hymenoptera, Diptera and Aptera..	2 10s.
"	"	Snakes, Frogs, Proteus and Crayfish..	2 10s.
"	"	River and Land Shells.....	2 10s.
"	"	Indigenous Botanical Specimens....	10 10s.
"	"	Mineralogical Specimens.....	10 10s.

The trustees of the Institute proposed to make it a central Institution for this part of the province including the counties of Leeds, Grenville, Lanark, Renfrew, Carleton, Prescott, Russell, Pontiac, Vaudreuil and Argenteuil, and for this purpose addressed a memorial to each municipality. Although sympathy was expressed for the movement, the plea of want of funds prevented carrying out the project.

Almost from the beginning there was an agitation for the erection of a building for the society, and many a time the object seemed on the eve of being realized, yet up to the present it has not been accomplished. The problem is one which the friends of the society should resolutely grapple with in the near future.

Although the lectures were held in Temperance Hall, yet the whilom Assistant-Librarian was not influenced much thereby, for it is recorded that "in consideration of ——'s promises to keep sober he be allowed to continue on trial."

In May, 1856, arrangements were made with the Gas Company for lighting the rooms. And in August of the same year it was resolved to change the name Bytown in the title of the Institute to Ottawa. At the same meeting (August) Dr. J. A. Grant became Curator, succeeding Elkanah Billings, the noted geologist, who removed to Montreal.

By a resolution of the Trustees all religious papers were excluded from the reading-room, except as donations.

On April 7th, 1858, we find for the first time the money recorded in dollars, instead of pounds, shillings and pence as heretofore.

On March 1st, 1863, the Institute moved its quarters to the two upper flats of the premises of Geo. Hay, lot 26, south side of Sparks street.

From its inception, the Institute did useful work and exerted a beneficial influence upon the community of far reaching effect. From it many rivulets of thought and action were born, which, with increasing years gained in strength, and bestowed manifold benefits on the community. There can be but little doubt that the Institute played a not unimportant part in the development of Ottawa. The names of those who especially identified themselves with the Institute are shown in the appended list of officers.

By an Act of Legislature the Mechanics' Institute and Athenæum and Natural History Society were incorporated December 24th, 1869, as the Ottawa Literary and Scientific Society.

Natural History Society of Ottawa.

From the minutes of this Society we find that it was formed to "develop the Natural History of the Ottawa, and general resources of the surrounding country."

A constitution and by-laws were adopted on October 3rd, 1863, and the Society entered upon an active career. At first monthly, and later, bi-monthly meetings were held, lectures were given and natural history specimens collected on the monthly Saturday excursions during the summer

season. In June, 1865, on request of the Society, room was granted in the library of the Mechanics' Institute and Athenaeum for the museum of the former. The Society was incorporated by act of the Legislature on August 15th, 1866.

On July 1st, 1867, the Dominion of Canada was born and shortly afterwards (July 16th) a committee of the Society waited "upon the Premier with a view of obtaining his opinion as to the feasibility of moving the Geological collection of Canada (from Montreal) to the metropolis." This was subsequently carried out (1881), and naturally had the effect of lessening the relative value of the small museums begun in Ottawa, while opening a wider field of comparative study to the members of the Society.

Addresses of welcome were presented by the Society to the Governors General, Viscount Monck, in 1867, and to Sir John Young (Lord Lisgar) in 1868, respectively.

Among the number of active and zealous workers the name of the curator, Dr. Van Cortlandt, stands out pre-eminent.

In time it became apparent to many members of the Society who were also members of the Mechanics' Institute and Athenæum, the parent organization, whose field practically included the field of the former, that an amalgamation was desirable. Several joint meetings of committees were held, and union was agreed upon. The Society held its last meeting on December 10th, 1869, and on December 24th, 1869, by Act of the Legislature, the two Societies were incorporated as the Ottawa Literary and Scientific Society."

Ottawa Literary and Scientific Society.

The beginning of the year 1870 saw the Literary and Scientific Society launched on the career of usefulness, which it has pursued up to the present day. In the Act of Incorporation the aim and object of the Society are set forth in the few, yet comprehensive words, "the cultivation of literature and science."

Those who had been active workers in the two organizations out of which this Society was formed continued to take that active interest so essential for the well-being and progress of any Association. The progress of the Society during these past 28 years has not perhaps been as great as could have been wished, still it has ever occupied an honorable and worthy place in the community; and there

can be no question that, apart from the influence of the library and reading room, its annual courses of lectures have exerted an elevating and cultivating influence that is difficult to measure in the intricacies of the social structure.

As with the Mechanics' Institute, the Society has at various times, attempted to secure a building of its own, but the money question involved has, unfortunately, up to the present time not been solved, although the amount involved is not large, not more than $10,000.00. It is questionable whether any public benefaction would confer so much lasting and increasing good as the erection of a home, so to speak, for the literary and scientific workers in our midst, a place where they and other thinking men could meet and exchange thoughts, where lectures both popular and technical could be delivered, and whence a humanizing stream could flow throughout all classes. Let us hope that the near future may plant such a monument for a generous benefactor.

The first general meeting of the Society was held January 11th, 1870, when a code of by-laws was adopted. A week later a second general meeting was held and the first election of officers took place. At this meeting the first life members, James Cunningham and George Kennedy, were elected "in consideration of their long and efficient services as Treasurer and Secretary respectively of the late Mechanics' Institute and Athenæum."

The first annual meeting of the Society was held on April 29th' 1870, and the Librarian's report showed that there were 971 volumes available for circulation. The number at the present time is 3,861. During its first year three lectures were delivered, the first by W. D. LeSueur on "The Greatest Critic of the Age;" * the next by William Kingsford, the historian, on "Copper Coins of England;" and the last by J. H. Rowan, on the "Great Pyramid."

From the beginning a small museum was connected with the Society, but since the removal of the Geological Museum from Montreal to Ottawa, the former has lost its interest, and no efforts for its maintenance are now being made. Many of the specimens it possessed have been sold or otherwise alienated; and an organization—the Ottawa Field Naturalists' Club—was formed (1879), mainly through the

*Afterwards enlarged and published in Westminster Review for April, 1871, under title of "Ste. Beuve."

efforts of James Fletcher and other members of the Literary and Scientific Society, which has since been active in the prosecution of natural history studies. This club held its first meetings in the rooms of the Society.

We find in the annual report of 1871 that the following gentlemen subscribed $50.00 each towards the funds of the Society:—Lord Lisgar (Governor General), Edward M. McGillivray, Thos. C. Keefer, Thomas Reynolds, George Hay, Hon. J. Skead, Alonzo Wright, M.P., J. M. Currier, M.P., H. O. Burritt, J. G. Whyte, H. V. Noel, Nicholas Sparks and Robert Skead.

The first honorary member elected was Goldwin Smith on November 25th, 1871.

On October 8th, 1874, the Council passed resolutions for the formation of evening classes. They were thereupon organized and put in charge of the Rev. T. D. Phillipps, W. D. LeSueur, A. Smirle and J. Heyslop. Amongst the prizes offered to the classes was a gold medal by the Mayor, which was won by F. R. Latchford.

The Society participated in the former annual Provincial Exhibitions by making exhibits from its museum, and was privileged to name some of the judges in "Chemical Manufactures, Machinery, Natural History and Ladies' Work."

Since the founding of the Royal Society of Canada the Literary and Scientific Society has been represented by a delegate at the annual meetings of the former; and it has always embraced the opportunity of presenting an address of welcome to every Governor General on his arrival in Ottawa.

The Society owes a great deal to the liberality of the late Col. Allan Gilmour, who, in addition to being a life member, gave it two donations of $500.00 each and one of $200.00, as well as a number of books. He suggested to the Society the desirability of opening the reading-room on Sundays.

The Ontario government, ever solicitons for the education and advancement of the people, has yearly supplemented the efforts of the Council by a grant of money.

The Society has a membership now of 325; its library has about 4,000 volumes covering the various fields of literature and science; and its reading-room is supplied with many daily papers, weekly publications and the well-known magazines of literature, science and art. This liberal supply of

periodical literature attracts many readers, and strengthens the hold of the Society on its members.

In the preceding narrative the evolution of the Society has been briefly sketched. Imperfect as it is, the salient points at least have been taken from the minutes and proceedings from the first effort at organization in 1847.

In the appended list of officers will be found the names of those who have especially identified themselves in the advancement of literature, science and art, from the days of Bytown to those of Ottawa, and up to the present time, through the different organizations above mentioned.

It is to be hoped that this first instalment of the "Transactions" of the Society may serve a useful purpose, and prove to be the prelude to a long series of substantial contributions to the scientific and literary work of the Dominion of Canada.

OTTO J. KLOTZ,

June, 1898. *President.*

Officers of the Mechanics Institute.

1847—Hon. Thos. McKay, President; G. W. Baker, 1st Vice-President; Hammett Hill, 2nd Vice-President; Elkanah Billings, Corresponding Sec.; H. Bishoprick, Recording Sec.; Andrew Drummond, Treasurer; Robert Hill, Librarian.

1848—Hon. Thos. McKay, President; John Scott, M.P.P., 1st Vice-President; J. B. Lewis, 2nd Vice-President; W. P. Lett, Corresponding Sec.; H. Bishoprick, Recording Sec.; Andrew Drummond, Treasurer.

1849—G. W. Baker, President; Robert Hervey, 1st Vice-President; Hammett Hill, 2nd Vice-President; W. P. Lett, Corresponding Sec.; S. C. Keir, Recording Sec.; Andrew Drummond, Treasurer.

Officers of Bytown Mechanics Institute and Athenæum.

1853—Dr. Hammett Hill, President; Alex. Scott, 1st Vice-President; Gilbert Heron, 2nd Vice-President; H. J. Friel, Recording Sec.; Elkanah Billings, Corresponding Sec.; J. Cunningham, Treasurer; Dr. E. Van Cortlandt, Librarian; Elkanah Billings, Curator.

1854—A. Workman, President; C. J. Ford, 1st Vice-President; Robert Lees, 2nd Vice-President; C. R. Cunningham, Recording Sec.; Elkanah Billings, Corresponding Sec.; J. Cunningham, Treasurer; Dr. E. Van Cortlandt, Librarian; Elkanah Billings, Curator.

1855—A. Workman, President; Robt. Lees, 1st Vice-President; Henry Horne, 2nd Vice-President; C. R. Cunningham, Recording Sec.; Elkanah Billings, Corresponding Sec.; J. Cunningham, Treasurer; W. A. Ross, Librarian; Elkanah Billings, Curator.

1856—Robt. Lees, President; H. Horne, 1st Vice-President; Dr. Garvey, 2nd Vice-President; James Dyke, Recording Sec.; Wm. Clegg, jr., Corresponding Sec.; J. Cunningham, Treasurer; Dr. Van Cortlandt, Librarian; Elkanah Billings, Curator.

1857—H. J. Friel, President; Dr. J. A. Grant, 1st Vice-President; Dr. Garvey, 2nd Vice-President; Robt. Lyon, Recording Sec., Robt. Lyon, Corresponding Sec.; J. Cunningham, Treasurer; C. J. Ford, Librarian; Dr. F. D. Loughlin, Curator.

1858—Dr. J. A. Grant, President; Dr. Garvey, 1st Vice-President; George Heubach, 2nd Vice-President; George Heubach, Recording Sec.; H. V. Noel, Corresponding Sec.; C. J. Ford, Librarian.

1859—Chas. Armstrong, President; J. McKinnon, 1st Vice-President; J. M. Currier, 2nd Vice-President; R. Waddell and J. Fraser, Recording Secretaries; J. M. Hannum, Corresponding Sec.; J. Fraser, Treasurer; Wm. Hay, Librarian.

1860—Dr. Van Cortlandt, President; P. P. Harris, 1st Vice-President; J. Cunningham, 2nd Vice-President; F. Schofield, Recording Sec.; J. M. Hannum, Corresponding Sec., J. Fraser, Treasurer; Henry Horne, Librarian.

1861—Henry Horne, President; H. V. Noel, 1st Vice-President; A. Scott, 2nd Vice-President; Wm. Duck, Recording Sec.; J. R. White, Corresponding Sec.; P. P. Harris, Treasurer; J. L. P. O'Hanley, Librarian.

1862—C. R. Cunningham, President; Dr. S. C. Sewell, 1st Vice-President; J. M. T. Hannum, Recording Sec.; P. P. Harris, Treasurer; Dr. Van Cortlandt, Curator.

1863—Dr. C. S. Sewell, President; Wm. Duck, 1st Vice-President; Henry Horne, 2nd Vice-President; J. Lindsay, Recording Sec.; J. Cunningham, Corresponding Sec.; P. P. Harris, Treasurer; Alex. Currie, Librarian.

1864—H. J. Friel, President; George Sutton, 1st Vice-President; Wm. Hamilton, 2nd Vice-President; Jas. Buchanan, Recording Sec.; W. P. Lett, Corresponding Sec.; J. Cunningham, Treasurer; Dr. Sewell, Librarian; A. Currie, Curator.

1865—H. J. Friel, President; Wm. Hamilton, 1st Vice-President; George Hay, 2nd Vice-President; J. P. Robertson, Recording Sec.; W. P. Lett, Corresponding Sec.; J. Cunningham, Treasurer; John Thorburn, Librarian; A. Currie, Curator.

1866—H. J. Friel, President; C. R. Cunningham, 1st Vice-President; A. S. Woodburn, 2nd Vice-President; E. P. Remon, Recording Sec.; W. P. Lett, Corresponding Sec.; J. Cunningham, Treasurer; J. P. Robertson, Librarian.

1867—H. J. Friel, President; A. S. Woodburn, 1st Vice-President; Wm. White, 2nd Vice-President; Robt. Hunter, Recording Sec.; W. P. Lett, Corresponding Sec.; J. Cunningham, Treasurer; J. P. Robertson, Librarian.

1868—Wm. White, President; A. S. Woodburn, 1st Vice-President; E. P. Remon, 2nd Vice-President; George Kennedy, Recording Sec.; D. Matheson, Corresponding Sec.; J. Cunningham, Treasurer; John Thorburn Librarian.

1869—Wm. White, President; A. S. Woodburn, 1st Vice-President; G. M. Rose, 2nd Vice-President; George Kennedy, Recording Sec.; D. Matheson, Corresponding Sec.; J. Cunningham, Treasurer; J. G. Whyte, Librarian; John Thorburn, Curator.

Officers of the Ottawa Natural History Society.

1863—B. Billings, President; Thomas Austin, Secretary; Dr. Laughlin, Treasurer; Dr. Van Cortlandt, Curator.

1864—N. B. Webster, President; George Hay, 1st Vice-President; John Thorburn, 2nd Vice-President; Thomas Austin, Secretary; James Ogilvy, Treasurer; Dr. Van Cortlandt, Curator.

1865—N. B. Webster, President; Thomas Austin, 1st Vice-President; Rev. T. D. Phillipps, 2nd Vice-President; Thomas Daniel, Secretary; James Ogilvy, Treasurer; Dr. Van Cortlandt, Curator.

1866—N. B. Webster, President; Rev. T. D. Phillipps, 1st Vice-President; John Langton, 2nd Vice-President; D. Codd and Wm. White, Secretaries; James Ogilvy, Treasurer; Dr. Van Cortlandt, Curator.

1867—John Langton, President; Rev. T. D. Phillipps, 1st Vice-President; E. A. Meredith, 2nd Vice-President; Arthur Harvey and William White, Secretaries; James Ogilvy, Treasurer; Dr. Van Cortlandt, Curator.

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The Name of Ottawa.

By B. Sulte, F. R. S. C.

(*Extracts from an address delivered Nov. 19th, 1897.*)

The easiest way to obtain accurate information concerning the term Ottawa, Outaouais, Outaoua, is by perusing the different works of the 17th Century mentioned below, and leave aside all other books for the moment, until you have digested the texts of those authors, for they actually saw what they write about. Whoever dealt with the matter subsequently could not be in a position to make a clear case of it.

Take the following authors as the only base of information Champlain, Sagard, Marie de l'Incarnation, Dollier, Perrot, La Potherie, the Jesuit papers, and the records of the Conseil Souverain of Quebec.

Champlain met the people in question (1615) and called them Standing Hair, because of the fashion they had to dress their hair upright. This was in Lake Huron.

The Hurons, who spoke a language totally different from the Standing Hairs, and who lived in open fields, designated them as the Men of the Woods, to indicate that they were roaming in the forests (county of Bruce and Manitoulin Island.) In Huron-Iroquois language this was Ondataoua. The French translated it into Gens des Bois quite correctly.

There is no indication of the name by which the Outaouas designated their own nation.

Champlain : Cheveux Relevés : Standing Hair. No other name.

Sagard, 1625 : Cheveux Relevés and Gens des Bois are like one nation he says.

Jesuit Relations, 1654-56 : Ondataouaouat, Outaouak ; 1669, Outaouac.

Journal des Jesuits, 1654 : Ondata8a8ak *alias* 8ta8ak, 8ta8at. (8 is the softest sound of w.)

Conseil Souverain de Quebec, 1663, 1670 : 8ta8au, 8ta8ak.

Marie de l'Incarnation, 1660 : Outaouak.

Dollier de Casson, 1665 : Outaoua.

Nicolas Perrot 1660-1715 : Outaoua.

La Potherie 1700 : Outaouak.

That writers who came after 1700, and who never had any intercourse with the nation before its dispersion, took upon themselves to modify the spelling and pronunciation of the name by making it "Ottawa" and "Outaouais," has no effect on the above authorities; but it puzzles everybody and makes us believe that there is yet a problem to be solved in that direction.

There is no doubt that Ottawa and Outaouais are both wrong.

The French made "Outaoua" out of "Ondatahoua." No other explanation can stand the test of the authors of the 17th Century. The plural took k.

The final sound is a broad and open note: oua, ouat, ouak, ouac, 8ack. In French (Normandy) letter a is broad, like aw in English. When you meet with ouak and ouac, rest assured that this is written to satisfy the pronunciation of some Frenchmen who use the flat a, such as in Gignac, Frontenac, Balzac (south west of France.)

Ondata, if corrupted into Outa as I believe, is less easy to explain. One would conceive that it was Oudata, but all the printed works and all the manuscripts of the 17th Century have On instead of Ou.

The figure 8 placed in the centre of the word is there to represent a soft w: 8anakong for Wanakong, Kaminisk8e for Kaminiskwe. Eight is "huit" in French and must be sounded with that particularly soft tone the letter u has in the north and west of France. It is not ou nor w; to pronounce it you must round your lips and try to whistle softly. It is not generally found practicable to any other people but those who have used it from the cradle. That sole letter in the mouth of a man suffices to detect how far his origin is French.

For instance, ask an Englishman to pronounce *Huron*— and hear the word from the tongue of a Frenchman, you will understand that the French u is not at all like the English one.

Now that we have said that Outaoua comes from Ondataoua, let us see the opinion of modern authors who have given a different etymology without consulting the true sources in this matter.

Some suppose that the expression, Grandes Oreilles applied to the Outaouas is a translation of the latter name. We have already shown that Ondataoua means the Men of the Woods. The French said Grandes Oreilles: Large Ears, for the same reason they qualified them also Cheveux Relevés,

those whose hair is tied up on the top of the head, those who expose their ears, by contrast with other races wearing long floating hair covering the neck, the ears and part of the cheeks.

The final sound ouais: Outaouais, is the result of pure ignorance, and is not more than eighty years old.

The form Ottawa did not exist during the French regime; it was created by the English evidently from Outaoua.

As to the history of those people we have so often seen modern maps and books which place them in our valley that it seems impossible to remove that belief from the minds of of readers.

They were principally located in Manitoulin Island when Champlain met some of them at the mouth of French River in 1615. Afterwards they took refuge in Wisconsin for fear of the Iroquois. In 1654 they opened a trade with Montreal by the route of Lake Nipissing and the Grand River, then a perfect wilderness without any Indians on its shores. Gradually the Grand River became known as the passage of the Outaouas, the Outaoua. This application of the name of a far away nation to a Canadian River can be followed in the manuscripts covering the period of 1670-1700.

In the localities where the Outaouas emigrated two hundred years ago there are now ten or twelve towns, villages, railway stations and counties called "Ottawa." This is only right, although somewhat overdone.

The books and maps published in our century caused the Canadians to consider the "valley of the Ottawa" as the ancient residence of the Outaouas, and that name was imposed in good faith upon young Bytown. It is the consecration of an error. The Capital of Canada stands before us under a foreign name.

The Violinist.

By A. Lampman, B.A., F.R.S.C.

[*Read Nov. 19th, 1897.*

In Dresden in the square one day,
With wheezy bow and proffered hat,
A face of parchment seamed and grey,
An old blind violinist sat.

Like one from whose worn heart the heat
Of life had long ago retired,
He played to the unheeding street
Until the the thin old hands were tired.

Few marked the player how he played,
Or how the child beside his knee
Besought the passers-by for aid
So softly and so wistfully.

A stranger passed. The little hand
Went forth, so often checked and spurned.
The stranger wavered, came to stand,
Looked round with absent eyes and turned.

He saw the sightless, withered face,
The tired old hands, the whitened hair,
The child with such a mournful grace,
The little features pinched and spare.

"I have no money, but," said he
"Give me the violin and bow.
I'll play a little, we shall see,
Whether the gold will come or no."

With lifted brow and flashing eyes
He faced the noisy street and played.
The people turned in quick surprise,
And every foot drew near and stayed.

First from the shouting bow he sent
A summons, an impetuous call;
Then some old store of grief long pent
Broke from his heart and mastered all.

The tumult sank at his command,
The passing wheels were hushed and stilled;
The burning soul, the sweeping hand
A sacred ecstasy fulfilled.

The darkness of the outer strife,
The weariness and want within,
The giant wrongfulness of life,
Leaped storming from the violin.

The reins of glittering carriages
Were checked and drawn from far and near,
And all with wondering countenances
Leaned from their cushioned seats to hear.

And then the player slacked his tone,
And wrought another miracle
Of music, half a prayer, half moan,
A cry exceeding sorrowful.

A strain of pity for the weak,
The poor that fall without a cry,
The common hearts that never speak,
But break beneath the press and die.

Throughout the great and silent crowd
The music fell on human ears,
And many kindly heads were bowed,
And many eyes were warm with tears.

"And now your gold," the player cried,
"While love is master of your mood;"
He bowed, and turned, and slipped aside,
And vanished in the multitude.

And all the people flocked at that,
The money like a torrent rolled,
Until the grey old battered hat
Was bursting to the brim with gold.

And loudly, as the giving grew,
The question rose on every part,
If any named or any knew
The stranger with so great a heart.

Or what the moving wonder meant,
Such playing never heard before;
A lady from her carriage leant,
And murmured softly, "It was Spohr."

Place-Names of Canada.

By George Johnson, F.S.S. (hon.)

[*Read December 3rd, 1897.*

When all are here and no by-elections on, 213 members of the House of Commons assemble on Parliament Hill* to represent the people of the 200 electoral districts which include the whole country from the Atlantic to the Pacific.

Each of these divisions has a name. Included in each division are many subdivisions, in all cases having distinctive names; excepting in the case of Prince Edward Island, where the subdivisions are distinguished by numerals, to-day as they have been for 130 years.

These divisions are known, in most of the Provinces, as Counties, and the subdivisions as Townships, Parishes, Municipalities, Polling Districts, etc.

Divisions and Subdivisions, as we had to deal with them in the Census, numbered 3,600 census places.

Consultation with the Post Office List provides the information that there are over 9,000 post offices in the country, each with a place-name; some of them duplicates of the place-names of the electoral districts and of the Census subdivisions; most of them not so.

A study of a good map reveals the names of Lakes, Mountain ranges, Mounts, Rivers and Streams—thousands of them; many of the names not duplicated in the names of the Counties, Parishes, Townships, Municipalities and Post Offices.

Taking the map as a guide we travel along the coast-line of the Dominion, from the fire-devastated town of Wind-

*Parliament Hill is a very appropriate name. The hills were the ancient places of meeting for conference on public affairs. Thus Mote Hill, near Scone in Scotland, had the famous scone stone on which the Kings of Scotland were crowned and on which, since its removal to Westminster Abbey, during 6 centuries 27 Sovereigns of England and of Great Britain have been crowned. Moot Hills abound in England. and *Ludlow* means "the people's hill." Parliament is French for talk, Hill is Anglo-Saxon. Parliament Hill exactly suits the condition of this double-raced, doubly blessed Canada of ours,

sor, N. S., along both sides of the meadow-decorated Minas Basin and the tide-scoured Bay of Fundy; round rock-ribbed Nova Scotia; around the island-sentinelled Gulf of St. Lawrence; along the Labrador coast that has witnessed for centuries the gay or gloomy procession of icebergs, torn from their colossal cradle of the North and hurried by the Polar current to their grave on the submerged shores of the Gulf Stream; around the silent Hudson Bay with its ice-fringed coasts; along the Arctic* littoral, the very home and throne of our "Our Lady of the Snows;" and adown the Pacific shores over which the *Kuro-siwa*† pours its tempering heat and abundant moisture. Everywhere we find names of islands, of gulfs, bays, coves, harbours, inlets, canals and other indentations of the coast-line—also by the thousand.

We have thus many thousands of place-names to deal with, and every name has a meaning. It had an origin and it has a significance.

To those interested in the study of place-names, the questions naturally arising are (1st) "who gave the name," (2nd) "why was the name given?"

To answer the first question would be to sketch with more or less of detail the place-name Fathers of Canada. Missionaries and navigators, saints and sinners, lordly rulers and humble porters, politicians and civil servants, sovereigns and speculators, explorers and store-keepers, surveyors and railway presidents—English, Basques, Portugese, Spaniards, French and Indians—have scattered, with profuse hand, place-names in every part of the Dominion.

To tell about those who have taken a prominent part in the place-name giving of Canada would be to tell of Cabot, Denys, Hudson; Cartier, Champlain, Roberval; Drake, Gilbert, Cook, Vancouver; Bréboeuf, Rambault, Albanel; Verandrye, Mackenzie, Frazer; the Simpsons, George and Thomas; La Salle, Marquette, Jolliet, Thompson, Henry; Rae, Simcoe, Guy and Thomas Carleton; Bayfield, Desbarres, Commander Bolton; Perley of New Brunswick, Geo. M. Dawson, William Ogilvie, Robert Bell; W. D. LeSueur, A. P. Low, R. G. McConnell; J. B. Tyrrell, W. C. Van Horne and many others,

*The Arctic ocean received its name from the Greek word *Arktos*, a bear, on account of the northern constellations of the Great and Little Bear—which sparkle in its waters. Our Great Bear Lake derives its name from the same source.

†The Black Current so called from its dark blue color which contrasts with the green of the ocean through which it flows. Kuro-Siwa is a Japanese word.

who during four centuries have been the place-name fathers of the country, on a large scale. It would be to tell of the Browns, the Smiths, the Joneses, the Robinsons and all the other individuals who became "men of light and leading" in a thousand Canadian communities, whose virtues are perpetuated in the Smithvilles, the Bell's Corners, the Bellevieux Coves, the Baker's settlements, etc., and who, by their superior energy or by accidental environment, have given their names to many of our Post Offices. I made a count of these and found that there are over 500 post offices in the country whose names correspond to those of the Post Masters actually ministering to the demands of the several communities for epistolary correspondence and for the ever-welcome family newspapers.

Such stories of the place-name fathers, great and small, would be replete with interest to young and to old alike, each having its full share of moving incident by sea and by land, by flood or by field.

With Cabot, on board the *Matthew*, we would have to scout along the shores of north-east Canada, now cautiously entering unknown straits, now exultingly sailing into broad and deep harbours, disturbed by many storms of wind, but happily undisturbed by the vapourings of a Harrisse or the disquisitions of a Dawson on the landfall question. With Basques and Portugese we would have to visit almost surreptitiously (modern fishermen-like), rivers such as the St. Lawrence and Miramichi, and follow porpoise and whale far up their courses. With Cartier we would have to venture through the gloomy portals of the Saguenay and pass through the forest-lined waters of the great river, giving names to frowning cliffs, heated bays, luxuriant islands and glorious promontories. With Vancouver we would have to wander, on board the "Discovery" or the "Chatham," amidst the floods and mazes of the Straits of Georgia—now sweeping on under full sail, now moving cautiously and heaving the lead at every point, and now making preliminary explorations in cutter and rowboat, watching the water for hidden rocks and shoals and the land for ambushed natives. With Wm. Baffin or John Davis, or Martin Frobisher* or Henry Hudson or Luke Fox or George Back or Capt. Dease or Edward Perry or John Franklin or Francis McClintoch or Thos. Simpson, we would

*Whose tomb in St. Giles Church was threatened by the great fire in London, Nov. 1897.

have to push our perilous way among the ice-floes of the Arctic slope of our country; study the Aurora-Borealis race in that part of the world where, in their most gorgeous garbs, they most rapidly flit ere you can point their place; and endure the monotony of a six months' day and a six months' night as the compass of our year.* With Champlain we would have to traverse the unknown Ottawa, watch the Indians offering tobacco † to their deities on the rocks of the Chaudière Falls, follow the "trough" to Nipissing, and, after many vicissitudes of fortune, gaze upon the waters of the *Mer Douce* (Lake Huron) and of the other Great Lakes.

With Verandrye we would have to make journeys full of perils from Lake Superior to Lake Winnipeg, and thence along the rivers of the plains. With Sandford Fleming‡ we would have to cross from "Ocean to Ocean" by unknown paths over the mountain ranges of British Columbia. With Geo. M. Dawson and Wm. Ogilvie, we would have to enter the Yukon region, watch McConnell make a micrometer survey of the Stikine, and Ogilvie secure chronometer longitudes for the establishment of the boundary line, and help Dawson name Mounts *Lorne* and *Lansdowne* and *Logan* and *Jubilee* and a score of other places—shoot, with these explorers, the White Horse Rapids, and scale the Chilkoot or the Chilkat Pass—chilled to the bone. With Dr. Robert Bell we would have to foot it in the inhospitable country of Nipigon or of Baffin Land, or in the hydrographic basin beyond the sources of the Ottawa river, where the *Bell* river tintinnabulates through golden sands into Rupert Bay, where Mount *Laurier* lifts high its crest, and where Lake *Beatrix* recalls Lord Lansdowne's gentle daughter and her brilliant marriage ceremony of a month ago. Under the guidance of J. B. Tyrrell we would have to penetrate the Barren Lands and discover and name in 1893 the *Geikie* River, 900 miles long, "in honor of Professor James Geikie of Edinburgh, who has done so much to foster the study of glacial geology."

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*For the effect of these voyages on English literature see Sedgwick, Atlantic Monthly, March, 1898.

†Mr. Moncure Conway says that a true history of tobacco would be a history of English and American liberty.

‡Sir Sandford Fleming, K.C.M.G., gave many of the place-names along the Intercolonial Ry., named all the stations along the C. P. R. from East of Lake Superior to Winnipeg and is memorized in the place-name *Fleming* in Assiniboia.

With Sir William Van Horne* we would have to toil and struggle to provide the thousand place-names which had to be selected in connection with the naming of the stations of the C. P. Ry.

Plenty of cares, many stripes of pain, much vain wrestling with mosquitoes and cold and heat and privations of many kinds ; many Nansen-like experiences. But what a host of place-names we would have heard given by these Fathers of our Place-nomenclature.

We would have to follow in their devious wandering not alone the men who have been named, but also the Aboriginal Indians (the "naturals," Rev. Richard Hakluyt styled them) as their moccasined feet threaded the way through pathless forests, or their marvellous canoes and their matchless snow-shoes carried them along the streams and plains in their hunt for the sturgeon and the striped or white or blue or black bass and for the beaver, the buffalo, the moose or the caribou, and watch them as with wonderful insight they discover the great topographical features of the country and apply their names of music to them.

We must (however reluctantly) give upon this occasion, the idea of following the *thought-trails* suggested by the question "Who gave the place-names of Canada,"and confine ourselves to the query : "Why was the name given ?"

Isaac Taylor says "there are only about 300 German *grund-worter* (root words) which, variously combined with the *bestimmungs-worter* (designative words) constitute the 500,000 names which are found upon the map of Germany." No such clue have we to guide us through the labyrinth of our place nomenclature.

With us the first step is to ascertain whether the name is *enchorial* or is foreign—is local, indigenous, and with the flavour of the soil clinging to it ; or has come to us—as bananas and sardines and lemons and ostrich feathers come—from abroad; is, in fact, home-made, or is an imported article.

We have borrowed place-names, as well as money, from Great Britain—in the one case as in the other sometimes wisely and oftentimes foolishly. When we called a place *Sud-*

*Probably the place-name Father with the most numerous progeny of all the place-name Fathers Canada has ever had, though Dr. Robert Bell is a close second, if he does not take first place, having some 1,200 place-names to his credit in the various regions he has explored.

bury we did a foolish thing seeing that it means *Southborough* and has been transplanted to Ontario and given a local habitation in the *North* country, contrary to all the regulations of Onomatology.* Mr. Sulte at the last meeting of the Society gave us samples of foolishly selected names, including, as he contends, the place-name of this city—Ottawa. Sir William Van Horne mentions *Bergen* as a singularly inappropriate place-name, being situated in the middle of a great plain of Manitoba, while the original Bergen is a seaport of Norway surrounded by high mountains. Every feature in the new place is the direct opposite of the old place—the one a mountain-begirt town, the other a plain-encompassed village; the one washed by the briny ocean—and if you want to know what that means read Robert Stevenson's tale of the "Merry Men"—the other without any water, fresh or salt, in it; the one a great entrepot for fish and fish products, the other scarcely seeing a fish from one year's end to another.

A few months ago the Royal Society of Canada affixed a tablet to the Province Building in Halifax to commemorate the connection of the Venetian merchant †with our country. The plan adopted in this case has been a favorite for many years; only the tablets have taken the form of place-names derived from surname, christian name and title of persons who in some way or other have been associated with Canada. Our borrowings in this line have been extensive. Very few Lords of Plantations, Secretaries of War (when these were also Secretaries for the Colonies) and Secretaries and Under-Secretaries for the Colonies (since 1854) have escaped the seaching place-name hunter called upon to baptize the new township or county or village with a name that will sufficently identify it. Of the 108 of these functionaries who have administered our affairs in the Imperial Government since 1768, I failed to find among our place-names, Castlereagh, Hicks-Beach, Chamberlain, Ball, Pirbright, Meade, Pauncefote and Bramston—8 out of 108.

Since Jacques Cartier's time Canada has had 300 kings and queens, governors, governors-general and lieutenant-gov-

*Sometimes a great and important fact is embalmed in a place-name applied in the reverse of the Geographical position. Thus Sutherlandshire occupies a far North place on the map of the Island of Great Britain though it means the *South* land. The name was evidently given by persons living north of Great Britain; probably the Norwegian settlers of the Orkney Islands gave it.

†Cabot is appropriately memorized in Cabot Straits—the water passage between Newfoundland and Cape Breton.

ernors, including my old friend Lt.-Gov. McInnes of British Columbia and the latest appointed, Sir Oliver of Ontario. From them we have drawn the place-names of about 60 of our electoral districts and of several scores of our minor subdivisions.

Halifax, Osborne, Walpole, Pelham, Hardwicke, Granville, Newcastle, Rockingham, Carleton, Dundas, Shelburne, Grenville, Lansdowne, Liverpool, Eldon, Elgin, Canning, Goderich, Melville, Grey, Fox, Palmerston, Melbourne, Brougham, Wellington, Lyndhurst, Peel, Lytton, Stanley, Gladstone, Salisbury, Hartington, Russell, Bright, Clarendon, Beaconsfield, Spencer, Pembroke, Oxford, Bedford, Dunk, Sandwich, Mulgrave, Clarence, Somerset, Egmont; Aberdeen, —these and several scores more are place-names of Canada given because those for whom they were named were Lords of the Admirality, Colonial Secretaries, Premiers, Secretaries of War, Governors, or other high officials of the Empire. In connection with these names there is wide scope for historical reminiscence having a distinctively Canadian flavor.

In the same way and for the same reasons, the sovereigns of Great Britain and their sons and daughters are memorized in Canadian place names. We have King's Counties and Queen's Counties and Georgetowns and Williamsburgs, and Louises and Albert Edwards and (illustrative of the comparative youth, as well as of the abounding loyalty of the country,) we have 30 Victorias and Victoria Beaches, Peaks and Dales.

From French statesmen, governors, etc., we have borrowed our place-names of Jacques-Cartier, Roberval, Champlain, Montmagny, Coulonge, Lauzon, Frontenac, Vaudreuil, Longueuil, Beauharnois, LaTour, Chambly, Bonaventure, Montcalm, Marguette, Provencher, Laval, Iberville, Lévis, Lotbiniere, Richelieu, Charlevoix, Montmorency, Nicolet, Soulanges, Verchères—the mention of which names calls up the long succession of able men justly held in sweet remembrance by our French brothers.

I do not know how better to illustrate this feature of our place-naming than to take British Columbia and New Brunswick as examples, presenting each in the form of a monograph.

BRITISH COLUMBIA

FROM THE PLACE-NAME POINT OF VIEW.

When Columbus set sail from a Spanish Port on the 3rd August, 1492, with three vessels and one hundred and twenty men he believed that he would sight land if he sailed long enough; and that the land would be the Indies. The Old World path along which commerce plodded was that which crossed the land at the eastern end of the Mediterranean and thence by the Indian Ocean found its *eldorado* in the East. Hence, Venice, as the western terminal and distributing point, gained great wealth and aroused the jealousy of Spain and other nations of Western Europe. These sought the Indies by rounding the Cape of Good Hope. Columbus conceived the idea that as the earth was spheroidal in form he could abandon the shore-hugging way of the past and, boldly venturing on the wide, unknown ocean, sail on in a westerly course and reach the land of riches. When he found his way barred by an immense continent, he, Americus Vespucci and others sought along the coast for a passage that would take them to the western shores of the Pacific Ocean, on the east coast of which were the wealth and commodities of the Indies and Cathay, the gold and diamonds and precious stones that had given a magnificent sparkle to all the legends told to the wondering sons and daughters of Western Europe.

After them came other navigators who sought to pierce the continent, and in the hope of so doing ranged as Arctic explorers from the Straits of Belle Isle northward to Greenland, sometimes pushing the prows of their vessels into Hamilton Inlet and Ungava Bay; at others forcing their way into Hudson's Great Bay and all along through the ice-girt islands that now compose the Island Province of the Dominion, the new-born District of Franklin; or passing into the Gulf of St. Lawrence, pushed up the river, past Montreal, past Lachine, past Lakes Ontario, Huron, Superior, and on, still on, seeking the water courses that would carry their ships out into the Pacific and on their way to China and India; or poking their vessels' noses into every stream and river and gulf from the Bay of Fundy to the Gulf of Patagonia, thinking that in each

great river or deep indentation they were to make the great discovery that would wrest from the Old World trade-path its pre-eminence and give the western people of Europe their share of the commerce that had enriched the Mediterranean countries. Finding no opening in all their search along the shores from Hudson Strait to Magellan Strait, they sailed round the southern end of the continent and turning northward painfully began anew their search for the passage of whose existence they were so positive that they called it, in advance of discovery, the Anian Strait.

Among the early navigators who searched the western coasts of the continent, one of the earliest was Juan de Fuca, a Greek sailor engaged by the Spanish Government and sent out by the Spanish Viceroy at Acapulco in Mexico. He asserted that he had found the desired passage in the Strait that separates Vancouver Island from the mainland and into which the Fraser River opens its wide mouth. This was in 1592 and we have a reminder of the Greek sailor's trip in the place-name, "Juan de Fuca Straits." Before this effort Admiral Drake—the great seaman who took so active a part in the revolution of the 16th Century by which the transition from galley warfare to warfare under sail, from the period of oars to the period of sails, was effected, and the further evolution of the British ship of war from its prototype, the Drakar or long ship of the Norsemen, to the "Terrible" type of steam-driven battle-ships, was made possible—in 1579 visited the Northern Pacific Ocean, having with him much plunder of Spanish vessels which he greatly desired to convey to English ports as swiftly and as safely as possible. He went north to the 49th parallel of latitude, found nothing that suggested a passage way through to the North Atlantic, turned the bows of his vessels southward and went to the "Island Kingdom" by way of stormy Cape Horn, from impalement on which his good seamanship saved him *

In 1774 Juan Perez in command of an expedition of discovery sailed from San Blas to head off the Russians then making explorations in the North Pacific Ocean. His instructions were to make land as far north as the 60th degree of latitude and take possession in the name of the King of Spain. He visited Queen Charlotte Islands and Nootka Sound which he named *San Lorenzo*, a name which took no hold but soon

*Cape Horn was discovered and named by Schouten in 1616 after his birth place the town of Horn in the Netherlands.

disappeared, being properly swallowed up by the original Indian name. In the next year Perez again made his appearance on the coast and took possession of the northwest coast as far as Alaska, not finding, however, any passage; in fact shrouding whatever discoveries he made in the obscurity of deliberate concealment. His connection with our country is remembered in the place-name *Juan Perez Sound* in Queen Charlotte Islands.*

England now came to the front in the practical way that has made her so successful. She offered a reward of £20,000 to the discoverer of a passage north of the 52nd parallel. In March, 1778, Capt. Cook left the Sandwich Islands on his homeward trip after his voyage of circumnavigation and took the northern course, sighted Cape Flattery and concluded his narrative by writing when in latitude 69° 32′; "We are now upwards of 520 leagues to the westward of any part of Baffin's or Hudson's Bay and whatever passage there may be, it, or at least part of it, must be to the north of latitude 72°. Beyond naming the places he visited and making a small collection of furs he did little. That little, however, was of great importance. It changed the current of mercantile thought. If there was no passage, there were furs. There was business to be done and if the passage should be found well and good. It ceased to be the primary object. In consequence, there were the fur-trading explorations of Hanna, of Strange, of Portlock and Dixon, all of 1786; and Barclay's expedition of 1787, accompanying which was Mrs. Barclay, probably the first European woman to visit that part of the North Pacific Coast. Hanna named *Sea Otter Sound* and *Fitzhugh Sound*. To Strange we are indebted for *Cape Scott*, named after one of the Bombay merchants who fitted out his vessels. Dixon's memory is perpetuated in *Dixon Straits* and it was he who named *Queen Charlotte Islands*. Barclay is remembered in *Barclay Sound*.

Other expeditions were that of Meares in 1787-89 whose shipbuilding operations resulted in a quarrel between Spain and Great Britain only settled by a treaty signed at Madrid in 1794; the Kendric and Grey Expedition of 1788, the ships in this instance flying the United States flag; (they named the Columbian River after one of their vessels and thus indirectly gave us the place-name of the Pacific province, British Col-

*Anyone who wishes to study the Queen Charlotte Islands from the place-name point of view cannot do better than consult Dr. George Dawson's monograph in the Geological Survey Report of 1878-79.

umbia); the Martinez and Haro expedition, 1789; (they named Haro Strait for us); the Eliza expedition, 1790-95. commemorated in the place-name Port Eliza; and the Vancouver expedition, 1791-95 the chief objects of which were to make a vigorous search for the elusive Anian Strait, to find out what settlements had been made by other countries and to take possession of some English property in Nootka Sound.

In the meantime the Hudson's Bay Company, since 1670, had been extending their operations from the great bay from which they take their name, westward, till in 1782-3, the Northwest Company entered the field as determined rivals of the older company. One of the officers of this latter company, Alexander Mackenzie, wears double laurels, as the first discoverer of the Mackenzie River and its Arctic Ocean outlet, and as the first white man who went through the Rockies to the Pacific Ocean.

Subsequently the great lumber companies explored the bays and sounds and inlets in search of easily accessible forest trees, giving their names to many lakes just as in the Ottawa valley the men of the lumber-camps have given the names of many of their "bosses"* to the lake-feeders of the river.

Then came the gold discoveries, and then followed the Canadian Pacific Railway.

From all these sailors and shoremen, explorers and surveyors and lumbermen have come the place-names of British Columbia, many of them being Indian names or adoptions from the Haidahs, the Nootkas and the Shuswaps, the three great families of the Columbian group of aborigines. The marks of them all are upon the shores, the mountains, the islands, and the various forms of water—the rivers, inlets, lakes, gulfs, sounds, canals and arms.

As a name-father Capt. Cook is responsible for a number of place-names along the north-west coast of North America. He gave Cape Flattery its name on 22nd March, 1778, because from the lay of the land, "there appeared to be a small opening which flattered us with the hopes of finding an harbour." As in this instance Hope told not only a flattering, but what in the honest sea-captain's view was the same, an untruthful tale, he called the promontory Cape Flattery.

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*The evolution of the word "boss" is interesting. It was originally *base*—the man at the base; the man upon whom the enterprise rests. We say "It rests with him to make it a success." The Early Dutch on this continent used the word *Baas*, and the English sounding of "boss" soon came to spell it so.

He missed Juan de Fuca Straits by being blown to the westward. His next landfall was a place called by him King George's Sound, but which he, later on, suggested should bear the native name of Nootka. There he remained long enough to satisfy himself that the natives were a very superior race, "for," said he, "I must observe that I have nowhere in my several voyages met with any uncivilized nation or tribe who had such notions of their having a right to the exclusive property of anything that their country produces as the inhabitants of this Sound"—a characteristic of us Canadians to this day, whether at the British Columbian or the Nova Scotian end, with all that is between included. Cook sailed for the mainland where he sighted, on the 2nd May, Mount Edgecombe, well within the territory now claimed by the United States as Alaska. He journeyed along till the 26th. October giving place-names right and left—none of them however in Canadian territory—the few he gave along the Nootka Sound territory not surviving; "Nootka" has overwhelmed Cook's place-name of King George's Sound; "Point Breakers" has given way to "Point Maquilla," so named in honor of a native chieftian with whom Meares had dealings in 1786; while "Woody Point" has been re-baptised "Boulder Point" the woods having disappeared and the boulders having become the prominent feature.

As is quite natural, Vancouver is the greatest name-father of the British Columbian coast. He was one of the early comers. He found an almost virgin soil in which to plant his place-names with every expectation of their taking root. He was engaged in a task that led him, in prosecuting it, to examine the coast very carefully. He was therefore all the time searching the nooks and crannies of the coast.

On the 8th March, 1791, Capt. George Vancouver received instructions, signed by Chatham, Hopkins, Hood and J. T. Townsend, to proceed to the Sandwich Islands, winter there and go in the Spring to the North West Coast of North America to obtain accurate information as to other nations who might have settled there and especially to obtain information for His Majesty's use in respect to the "water communications, which may tend to facilitate an intercourse, for the purpose of commerce, between the North West Coast and the country upon the opposite side of the continent inhabited by

the king's subjects." In 1791 His Majesty's subjects thus referred to were preparing to separate, Upper from Lower Canada, and to hold their first Legislative Assemblies. They were not troubling themselves very much about the passage to China or about a way across the continent by means of water-stretches. They had to hew down the forest, hunt up sweethearts, prepare homes for them and work out the problem of life under many discouragements. But no doubt in many a home in the back-woods as well as in such centres of population as Montreal, (population 20,000,) Quebec and Halifax there were those who waited eagerly for news of the Vancouver expedition round the world. However that may be, Capt. Vancouver sailed out of Falmouth, England, on the 1st. April, 1791, in the "Discovery" accompanied by Lieut. Broughton in the " Chatham." He decided to go by way of the Cape of Good Hope and see what Capetown, then a Dutch Colony, was like and whether it was worth annexing to Great Britain (accomplished four years afterwards.) From the Cape he stretched across the wide sheet of ocean and reached Cape Chatham on 27th September, remaining on the Australian Coast to examine George Third's Sound. Thence they sailed to Van Dieman Land and New Zealand, leaving on the 22nd. November for the Society Islands where they remained till the approach of March gave promise of a kindly reception in the North West Coast. This coast was sighted on 18th. April 1792 after a month's run. On the 29th. April Vancouver reached Cape Flattery naming it "Claffet" thinking for the moment that was the name Cook had given it, and passed up the Straits of Fuca coming to anchor in a small bay now known as Neah's Bay, just round the corner from Cape Flattery.

His first place-name was not an attempt to supplant Captain Cook, and some time after, when he learned that " Flattery " was Cook's name for the promontory, he dropped his own and took Cook's place-name. The next day the sharp eyes of his third Lieutenant (Baker) saw a mountain towering high and covered with snow, and Vancouver at once named it " Mount Baker." Where the vessels anchored for the night the lay of the land reminded Vancouver of the look of Dungeness in the British Channel and accordingly he named the anchorage " New Dungeness."

The next day the yawl, the launch and the cutter started off with their occupants to explore the shores. They discovered

a large bay protected by an island from the northern winds, and Vancouver gave the bay the name of his vessel, "Discovery Bay," and called the island "Protection Island;" and then all returned to the ships well pleased with their day's work. The next day he made a circuit of a larger bay and called it "Port Townsend," in honor of one of the signers of his letter of instructions.

Day after day they pursued their task of discovering, and within a month had examined the huge "pocket" with its islets, its bays, its basins and had given to the 1,800 miles of coast it included, the general name of "Puget Sound" after Vancouver's second Lieutenant, Peter Puget. By June he was ready to proceed northward and to enter the great internal sea, of which on June 4th, in honor of the King's birthday, he took formal possession and named it, with bumpers, the "Gulf of Georgia." Thus far he had named Hood's Canal after Rt. Hon. Lord Hood, another signer of his letter of instructions; Port Orchard, after one of his men; Vashon Island, after "my friend Capt. Vashon of the navy;" Restoration Point, because the day they saw it was the day commemorative of "that memorable event, the restoration of Monarchy and of King Charles II as its representative;" and Penn Cove "in honor of a particular friend." Then during July and till August 25th, he was busy exploring and naming the hosts of islands, passages, inlets, &c., between Grey's Point and Cape Scott, the north west point of Vancouver Island. A glance at a good map will show that the 64 days were busy days. At Point Grey (named for Capt. Grey of the U. S. vessel "Columbia") he found two Spanish vessels engaged in surveying the straits, for Spain had her eye upon the region. Vancouver's courtesy was equal to theirs,and he called *Galiano* and *Valdez* Islands after the Commanders of these two vessels. Then he went on northward, ever seeking to find some inlet that would connect with the great inland sea, which in turn would bring the Atlantic Coast of North America within close distance to the Pacific and, thus supply the opportunity to establish that north west passage believed so firmly by many to exist. He explored and named (after Sir Harry Burrard of the Royal Navy) Burrard Inlet, upon a magnificent headland of which the fine city of Vancouver is built, a memorial, on the mainland, ot the great sea captain. He named *Atkinson Point* after a "particular friend;" *Anvil Island* "because of its shape;" *Point Upwood* "for an early friend;" *Howe Sound*, for Admiral Earl Howe; *Jervis Inlet*,

for Admiral Sir John Jervis; *Scotch Fir Point*, because of the first firs they had seen, reminding them, in the midst of a flora very different to that of their Island home, of Scotland; Harwood and Savary Islands for "old friends;" Johnstone Straits and Broughton Straits and Island and Mudge Cape and Hanson Island and Baker Passage to signalize his confidence in his officers, while the "middies" were not forgotten, as Hardwick Island and Points Duff and Gordon and other place-names prove. Nelson Island he named after "Captain Nelson of the Navy"—a seaman whose fame was within a few years to start ringing down the centuries. Thurlow Island and Chancellor Passage commemorate the great Chancellor of 1783, while Loughborough Inlet recalls Thurlow's alternating Chancellor, Alexander Wedderburn, Lord Loughborough.

Vancouver sighted the coast on the 18th April and rounded the northern point of Vancouver Island on the 27th August, and between these dates had given to more than a hundred places names which most of them retain to this day, a few having been changed after the United States, by the Oregon Treaty, secured a portion of the coast explored by Vancouver.

On his second voyage Vancouver sighted the coast of Vancouver Island on the 18th May, 1793, and after a few days set out to continue the survey of the mainland coast and returned to Nootka on Sept. 2nd, a period of three and a half months, during which he gave about 200 place-names and confirmed a dozen or more that had been given by previous explorers. He appears to have proceeded upon much the same plan as in his previous examination of the grandest archipelago the world possesses, that between the mainland of British Columbia and Oregon and the Island of Vancouver. Cape Caution, he so named as a warning to all future navigators to take special care when in its vicinity. Gardner Canal he named after Vice Admiral Gardner, who was in command of the station at Jamaica when Vancouver was there and who reported favorably of him, mentioning him to Lord Chatham and the Admiralty. Behm Canal after Major Behm "in recollection of the weighty obligations conferred by him on the officers and men of the Resolution and Discovery while while at Kamtchatka in 1779"; New Eddystone, because the rock looked like that on which the Eddystone light is perched; Escape Point and Traitor Cove, because the treacherous

natives attacked him in the last and because he and his men effected their escape from the first named. The great Edmund Burke, the centenary of whose death was observed last month (Nov. 1897) whose claim to renown is that he was a leading actor in the four high tragedies of his time—the revolt of America, the insurrection in Ireland, the misgovernment of India and the revolution in France—Burke has his tablet in our place-name of Burke Canal given by Vancouver; and this is so far as I can discover the only one assigned to him in Canada. From the part he took as advocate and agent of the 13 American colonies, Burke was not a favorite with the United Empire Loyalists who were giving place-names in Canada and the Eastern Provinces during the period of his greatest activity.

Point Higgins he named after His Excellency Senr. Higgins de Vallenar, President of Chili, in "commemoration of kindness" shown him. Point Wales (west point of Observation Island) after, he writes, "my much esteemed friend, Mr. Wales, of Christ's Hospital, to whose kind instruction in the early part of my life I am indebted for that information which has enabled me to traverse and delineate these lonely regions." While the early Loyalists in Prince Edward County on the northern shores of Lake Ontario were doing honor to King George III by using the christian names of his fifteen children for place-names, Vancouver, animated by the same thought was naming in honor of his King such places as Point Sophia, Point Augusta, Point Frederick, Point Amelia, Point Adolphus, Point Mary and Cape Edward. Port Fidalgo was named by Vancouver after Senr. Fidalgo who had visited the place in 1790 and bestowed several place-names in remembrance of his friends, but had omitted to use his own name. Vancouver thought such modesty should have its reward, and with his usual broad minded generosity rescued Fidalgo from oblivion by giving the port his name. Port Countess, one might readily suppose was named after some lady of that rank who had done a kindness to the ever-grateful sailor. It was really named in honor of Capt. Countess "of *the* Navy," as Vancouver always refers to it, as if there were no other navy worthy his thought. Cape Hamond, far up on the North west coast of this continent, Vancouver named after Sir Andrew Snape Hamond, some time Governor of Nova Scotia and landed proprietor of New Brunswick, who thus has the honor of having his name attached to places and rivers in the far West Pacific and in the Atlantic Provinces. In Point Couverain, Vancou-

ver perpetuated the "name of the seat of my ancestors." In Point Hunter he showed his regard for " my very particular friend and physician," Dr. Hunter. In Cape Henry and Englefield Bay he commemorated his "regard for my much esteemed friend, Sir Henry Englefield." Cape Decision he so named because he there decided that this cape formed the north west continental point, as Cape Flattery formed the south west point of the archipelago. On Sept. 5th. 1793, the great name-father of the coast of North West America reached Nootka and sailed off to the Sandwich Islands there to winter. On April 14th. 1794 he returned to finish his survey and signalized his return by naming Point Woronzow in honour of the Russian Ambassador at the British Court. Lynn Canal he named after "the place of my nativity, Lynn in Norfolk." About the 53rd. degree of north latitude one can find on a good map Mussel Canal, Carter Bay, and Poison Cove. These names commemorate one of the few deaths that occurred during Vancouver's lengthy absence from England. One fine June morning Mr. Barrie of Vancouver's vessel, the "Discovery," went with three seamen in a boat to explore an inlet. When they reached a cove they found and ate some shell-fish. They were soon attacked with numbness in their faces and extremities; then their whole bodies became numb. Mr. Barrie, alarmed at the symptoms, recommended them to "pull for dear life," as violent exercise would induce perspiration. The three sailors bent to their oars and, like the sturdy British seamen they were, they "pulled for the shore." On landing, one of them, Carter by name, rose to get out of the boat, but sank down. He was tenderly cared for by the officer and his two mates who had to a considerable degree recovered, but he grew worse and died at mid-day on the pebble shore, ministered to to the end by his staggering comrades, wead and faint but dauntless in their dire extremity. Vancouver mourned the loss of a "true man and a good sailor," and gave the three names in commemoration of the event. Wooden Rock, off Cape Ommancy, is a sailor's monument to a brother sailor, Wooden, who there fell overboard and was drowned in the swirling tide. In his log Vancouver wrote he was "a good man and an active sailor." Point Conclusion indicates that the task was done and that the great seaman may now turn the bows of his vessels homeward. On his way out he names Cape Addington after the "Speaker of the House of Commons" and reached Nootka on September 2nd; leaves on 16th October 1794 and arrives in the Thames 20th October, 1795, to

find that without any solicitation on his part he has been gazetted a Post Captain.

In B. Columbia the C. P. Railway people have given us *Field* after D. D. Field of the U. S. family of Fields to which Cyrus of Atlantic Cable fame belonged; Mount MacDonald, after Sir John of glorious memory; Mount Agnes, after our one Baroness, Agnes of Earnescliffe; Revelstoke, after Lord Revelstoke, one of the Barings; Mount Stephen, to commemorate George Stephen, who has taken it as his title; Mount Sir Donald, to keep in remembrance for future generations the Donald Smith whose unwavering faith in the *rail* passage—the real Anian passage—never faltered even when the fortunes of the C. P. R. were at their lowest point.

They or others have given us Mount Cartier, Mount Tilley, Mount Begbee—and have incidentally presented us with a very good idea, viz., the appropriation of our mounts as memorials of the Fathers of Confederation. We have enough to go round and leave lots for the premiers of Canada, for our great scientists, historians and poets.

NEW BRUNSWICK

FROM A PLACE-NAME POINT OF VIEW.

In 1757 the township of Cumberland was formed and named after Fort Cumberland, the name given by Col. Moncton to the French Fort Beausejour after its surrender in 1755. It was a strip of land fourteen miles wide and extending from Cumberland Basin to Bay Verte—the whole distance across the isthmus of Chignecto which connects Nova Scotia with New Brunswick. In 1759 the growth of population in Nova Scotia to the south and to the north of the isthmus led the Nova Scotian Executive Council to create a new county embracing all the population north of Kings County on the Basin of Minas. The new county taking, its name from the fort and settlement around it, was called Cumberland, and embraced all the present Province of New Brunswick.

In 1765 the Nova Scotian Council divided the county of Cumberland, leaving the north shore as far as Bay Chaleur to its former local connection and constituting the River St. John region and all west of it another county to which was given the name of Sunbury. The origin of the name is lost. The townships created in Sunbury at that date were Burton, Conway, Francfort, Gagetown, Maugersville, and New Town.

Burton was named after Brigadier-General Ralph Burton who had a good deal to do with Quebec after Wolfe had conquered on the Plains of Abraham as our good friend Dr. Brymner has shown. *Conway* after Henry S. Conway, he and the Duke of Grafton being Secrateries of State in the Rockingham Administration formed in 1765; *Francfort*, probably so named from the French fort; *Gagetown* after General Thomas Gage, who was the principal land-owner there. *Maugersville* after Joshua Mauger, whose name is first on the list of grantees of land in that township. *New Town* is, of course, descriptive.

There are, then, of the men influential enough to have their names given to their respective townships—Burton, Conway, Gage and Mauger. Of these four, Mauger would be the most influential. He was wealthy, had a distillery in Halifax, where Mauger's Beach still perpetuates his memory, and was engaged in large financial transactions with the Government. Thus in the Dominion Archivist's report for 1894, mention is made of the fact that the Lords of Trade writing to Acting-Governor Belcher in 1763 inform him that, when money is required, he is to apply to Mauger or his agent in Halifax, drawing on the Treasury in his favor. In 1764 Mauger was wrothy with the Lords of Trade and all the officials, and declared that, if he "does not get back the money, he will petition Parliament," "one good effect of which," he says, "if there is no other, will be to warn people against advancing money on account of Government." His complaint appears to have secured the support of Chief Justice Belcher; for in February, 1765, that functionary states Mauger's case to the Lords of Trade. In the same year (Oct. 28th) the Governor (Wilmot) advises the Lords of Trade that he has drawn on them in favor of Mauger for £1,504. Evidently Mauger had influence and had a great interest in the new county formed on the banks of the St. John River. What more natural than that he should have suggested to Montagu Wilmot that Sunbury would be a good place-name, taking it from the village of Sunbury, near London?

Whatever the origin of this early county place-name, it is certain that population increased and with it the desire to have a larger Colonial establishment. In 1784 New Brunswick was erected into a separate province and Thomas Carleton was appointed its first Governor. Thousands of United Empire Loyalists had found their way to the Maritime Provinces and thousands more began the great work of colonizing the littoral of the St. Lawrence from Lake St. Francis to Lake Ontario; the shores of Lake Ontario as far as the Bay of Quinte; the neighborhood of Niagara and part of the shores of the Detroit River. They were finding homes in the ports of Shelburne, Halifax, Guysboro. They were penetra ting into the valleys of the Annapolis and the Cornwallis and the Avon. They were pouring into the St. John River region, in great numbers. Organized government must go with them. It was in those days felt to be a difficult, if not an impossible, task to manage from Halifax the affairs of the people in such distant regions as Burton and Gagetown. So Thomas Carleton was sent to do the work.

No doubt he and his Council studied the subject carefully. The first work they had to do was to divide the province into counties. They found on the map the counties of Cumberland and Sunbury—too large and unwieldy for purposes of home rule. Accordingly they began to subdivide and to name the subdivisions. Cumberland belonged about equally to both provinces. But the newer yielded gracefully and abandoned Cumberland as a place-name to Nova Scotia. They did the next best thing. Looking on the map of England—the motherland for whom so many had sacrificed everything, home and ease and wealth and friends—they saw that Cumberland was adjoined by Westmoreland and Northumberland. What better names than these could be suggested? Surely none. So these two were adopted. The monarchic principle found expression in the place-names of Kings County and Queens, lying side by side. In St. John they preserved in its English form the old name given by De Monts in 1604. In Charlotte County (after Queen Charlotte) there is an exhibition of that strong personal love for the sovereign which characterized the men and women of that period. Sunbury, shorn of its giant dimensions, was retained as the sole memorial of the province's former connection with the sister province of Nova Scotia.

The new names and boundaries of the counties were authorized by Royal letters patent in May, 1785.

During the next year, 1786, the Governor and his Council appear to have addressed themselves to the task of subdividing the eight counties they had created.

Following the division into two counties made in 1765, several townships had been named by the Nova Scotian executive and in addition to those already mentioned, there were Hopewell, Hillsborough, Moncton, Campobello (1770) Sackville (1772) and Prince William (1783), all, except Campobello and Prince William, in the Cumberland division.

These had all been designated townships in accordance with the plan adopted by Nova Scotia.

But the Governor and Council of New Brunswick objected to the word "township." Possibly they feared it as too suggestive of the New England *Town* which had proved the forcing house of revolt, the hotbed of rebellion. Possibly, too, many of them had come from Maryland and Virginia, and were thus familiar with the word *Parish*; or probably it sounded more English to men who shrank from having around them any reminder of the cruel harshness meted out to them by the successful rebels. Whatever the reason, they decided upon the word *Parish*, instead of township, to represent the subdivisions of the county. They changed Amesburg into Kingston. Francfort was merged into Queensburg; Conway was divided between Lancaster and Westfield; Newton became St. Marys—and the twelve of the period prior to 1784 became 26, and these in the years intervening became, by 1891, 162 parishes and wards, forming the units adopted in the Census work, of which 66 per cent. or two-thirds are names of persons or places of English origin.

I have not time to give in detail the place-names of New Brunswick with their meanings. The name of the Province was selected in honor of the reigning family the word *new* being given in accordance with the precedent established when New France, New England, New Netherlands, New Sweden and New Scotland (Nova Scotia) were adopted.*

*Anyone who wishes to study more minutely the place-names of New Brunswick is referred to a paper by Prof. Ganong in the Canadian Royal Society's Proceedings for 1896. Ganong divides the place-naming period of New Brunswick into (1) The Indian period; (2) the period of exploration, 1000-1604; (3) the French period; (4) the New England period, 1760-1783; (5) the Loyalist period, 1783-1790, and (6) the post-Loyalist period, 1790-1896. He says New Brunswick is rich in Indian place-names and that, with three or four exceptions, the names of the rivers, lakes and harbors are of Indian origin.

OTHER ILLUSTRATIONS.

Connected with the place-names tender sympathy sometimes crops out. For instance Fort Connolly was named after James Connolly, whose daughter Nellie, a beautiful maiden of sweet sixteen, young Douglas (afterwards Sir James Douglas and Governor of Vancouver Island) along with his other duties, found time to woo and win as he sojourned, in the employ of the Hudson's Bay Co. in the region of Bear Lake at the head of head of the branches of the Skeena River on the far off Arctic slope of our vast country. No doubt after honoring the father, Douglas found his path to the lady's heart all the easier.

Frequently a story of hardship conquered by love and patience is embalmed in the place-name. The other day I read of Joan Murray Ritchie who had recently died. She was born in the little village of Knock in Dumfrieshire, Scotland, in 1809. Her father dying when she was a child she became a domestic servant with a family in Annan. When 24 years of age she married William Ritchie of Greystones. In 1841, with three children to care for, the couple came to Canada. Ritchie hired himself to a Scotchman of Vaughan for $100 a year with a house and pasture for a cow. After ten years he saved enough to buy a farm in the township of Flos, (name given from Gov. Colborne's wife's poodle dog), having himself during those years become an expert backwoodsman, while his wife had learned all that was required of a farmer's wife in those days. She knew how to make maple-sugar, to spin yarn and make homespun. She understood the art of the dyer and could take the wool from the sheep's back and put it through all the processes needed to transform it into a suit of clothes, to shield her *mon's* back and sides and front from the blasts of a Canadian winter. In 1851 the family moved to their new home in the forest of Flos and built them a log cabin on the banks of the Wye, (a transplanted Welch word signifying *water*, and therefore often used for rivers). In the first year the husband and father cleared a patch of ground for wheat and potatoes and then went away to earn enough money to carry the family over the winter, leaving the wife to take care of the lonely forest home. Year after year they worked and planned to surround themselves with comforts, and extended a helping hand to other settlers, till a village sprung up of which Ritchie was appointed Postmaster and to which he gave the name *Elmvale*, in honor of his

noble-hearted wife whose birth-place among the rugged Scotch hills was called *Elmvale*. Mrs. Ritchie survived her loving husband 30 years and had the happiness of seeing her children married and settled around her, the whole numbering 115, viz., 4 daughters, 3 sons, 72 grandchildren, 35 great grandchildren and one great great grandchild.

Gratitude is embalmed in some place-names. Here is one example, "to our purpose quite."

In the forties there lived in Louisiana a man named Rev. William King who married a planter's daughter. On her father's death she inherited 15 slaves. These, on her death, Mr. King liberated and, after selling his Louisiana plantation, carried them to Canada in 1848. He found in Western Canada (now Western Ontario) a large number of fugitive slaves, very ignorant and living in great poverty. In 1850 he presented their cases to the Presbyterian Synod, then in session in Toronto, succeeded in enlisting the sympathies of its members, as well as those of other denominations, and secured the co-operation of Canadian anti-slavery societies. As a practical method of aiding the slaves a company was incorporated in June, 1850, called the Elgin Association. A prospectus was issued for the "social and religious improvement of the colored people of Canada" as the Association announced its object. The public was asked to take stock to the amount of $20,000. With the money 9,000 acres of land were purchased from the Government at an average cost of $1.75 per acre. This tract was divided into lots of 50 acres for which the colored settler paid $2.50 per acre in ten annual instalments with interest. Mr. King formed the nucleus of the settlement by giving his 15 freed negroes their land in 1850. While the Fugitive Slave Law was in operation in the United States many thousands of slaves found their way by the "underground railway" into Canada, and in 1853, 100 families had settled in the King tract, while many more occupied improved farms in the neighborhood. They were very helpful to each other, and most of the farms were cleared and homes built by means of "chopping bees," those warm-hearted neighborly institutions of early Canadian times. The settlers also found employment on the farms of their white neighbors and sold railway ties at seven cents each to the Canada Southern Railway then under construction.

As they advanced in prosperity a village sprang up in the settlement being the railway station of *Buxton*, so named by the colored people in honor of Sir Fowell Buxton, the dis-

tinguished philanthropist whose life-long devotion to the cause of the slave in the colonies of Great Britain resulted in the Imperial Statute of 1833, by which the last vestige of slavery was removed from Canadian soil. The village of "Buxton" memorizes to this day, and let us hope for all time, the great event of the legal abolition of slavery in the British Colonies, and the gratitude of the fugitive slaves who found an asylum in free Canada from the wrongs and sorrows of the land of their birth.

On the 27th May, 1753, there sailed out of Halifax Harbour a fleet of fourteen transports carrying 1,453 persons, mostly Germans, with a few French-speaking Protestants from Switzerland and France, under charge of 92 regular troops and 66 rangers. Their destination was Merleguesh. Landing safely they began to build a town which they protected, on the land side from Indians, by palisades and blockhouses, and on the water side from pirates, by a battery called Fort Bowscawen. With true German promptitude they began at once to obey the primal command "increase and multiply" for Jane Margaret Bailey gave birth to a child on the first night after the landing. From this band has largely sprung the 37,000 souls ascertained by the Census of 1891 to be the population of the fine County of Lunenburg—as the town and county were christened for the first settlers a fortnight before they left Halifax, in memory of Lüneburg, in Hanover, Prussia. One of their first acts after landing was to call the stream on the banks of which they stepped from the boats, *Rous's Brook* in honor of Capt. Rous under whose safe conduct they had come to their future home. Thus Capt. Rous is remembered in our place-names, and that his memory is worthy of perpetuation is plain from the fact that he was in command of the *Sutherland*, 50 guns, when Wolfe was before Quebec, and that it was from the deck of this ship that Wolfe issued his last orders before he climbed the steep slope leading to the Plains of Abraham and to fame.

In the year 1783 the British legion which had served with distinguished reputation in the war between Great Britain and some of her American Colonies under Col. Tarleton came to Nova Scotia and began a settlement at Port Mouton, and laid out the boundaries of a town to which they gave the name *Guysboro.* They soon found that the soil was stony

and barren, and, although they had built several dwelling houses, they determined to abandon the place. While they were making preparations for their departure a fire destroyed everything they had. A King's ship was at once despatched from Halifax with provisions, or they would have suffered from hunger and exposure. Most of them gladly seized the opportunity and removed to Chedabucto Bay at the eastern end of the Province, where they joined a number of persons, belonging to the civil department of the army and navy, who left New York when the British forces evacuated it; and as they had nothing else to take they took the name and gave it to the present Guysboro, leaving Port Mouton to rejoice in its original French name given it 180 years before by De Monts in 1604, because one of his few and precious sheep there jumped overboard and was lost. The new name of Guysboro was manufactured from the Christian name of Sir Guy Carleton, to do honor to the man to whom the British Authorities had committed the task of transporting from New York the thirty or thirty-five thousand Loyalists, Hessian soldiers and others, servants and slaves, who, on the conclusion of the war between Great Britain and her revolted colonies, resolved to cast in their lot with the mother land, and whose experience of Sir Guy's considerate mind and feeling heart had aroused in them the strongest regard for him.

These somewhat lengthy statements serve to show to what extent, and for what reasons, our place-names have been imported: some from the political relations that exist or have existed between the two mother countries and ourselves; others from sentimental causes that do credit to the warm hearts of the Canadian people, proving:—

> **"How far the gulf stream of our youth may flow**
> **Into the Arctic regions of our lives."**

Time would fail to tell of the authors, poets (Tennyson, &c.) heroes of the mother-land* commemorated in our place-names.

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*Oliver W. Holmes referring to the Mother Isle finely says:—

> **"One half her earth has walked the rest,**
> **In poets, heroes, orators, sages,"**

SECOND DIVISION.

Passing to the other great division of place-names, technically the *enchorial*, they are of Indian and Canadian origin—using the word *Canadian* to include Nova Scotians, New Brunswickers, and all others, as well as the inhabitants of Old Canada.

They include (1) names derived from physical characteristics; (2) names derived from individuals of local fame.

The first class includes the Indian names of the country. These have the full, unadulterated flavour of the soil about them. They are aboriginal in their bouquet. Long before the coming of the White Man—long before De Monts sailed from Port Royal (now Annapolis) along the coast to Florida without finding a trace of the White Man—the Indian tribes had mapped out this continent and divided it among themseves. With their keen eyes and practical habits they applied place-names which embalm physical characteristics whose aptness, we, of these times, have no difficulty in recognizing. Most of the orographic place-names of to-day are of their coining. Thus, Massachusetts—"the great blue hill."

Many of the rivers owe their names to the Indians:—Mississippi, Saskatchewan, Assiniboine. Many of the portages over which the canoes were carried from one water-stretch to another still bear Indian names.

In the case of the imported place-names, those formed of material from outside, I used the Provinces of British Columbia and New Brunswick as repositories from which to draw illustrations. In the case of the Indians the other provinces may be drawn upon.

Manitoba is an Indian word meaning *Strait of the Spirit*, the Indian legend being that in the narrower portions of Lake Manitoba strange noises were heard by the Indians. These noises, not accounted for by any experience of the Indians, were considered supernatural, and, therefore, caused by the Manitou—the Great Spirit. Pere Lacombe says the word should be *Manitowapan*, *supernatural or god-like*—the Indian dwellers on the shores of Lake Manitoba deeming it to possess supernatural qualities; whether in the way of noisemaking or in the line of healing or what else, not specified.

Assiniboia, perpetuates the Assiniboins—a tribe of Indians whose name is thought by some to mean Stone boilers and

by others Dwellers in a rocky region—both epithets being true to fact.

Winnipeg comes, after various modes of spelling, from two Cree words—*Winne* "cloudy" or murky, and Napee, "water;" the Crees calling the Lake, Winnipec—meaning water tinged during the summer months with a green color owing to the presence of a vegetable growth which abounds in parts of the lake. "It is a minute, needle-shaped organism about half an inch in length, sometimes detached and sometimes in clusters, and at times the water is almost as thick as pea-soup."

Pembina ; nipa-mina, a Cree word for a red berry which grows in great abundance along banks of rivers.

Shubenacadie ; a place for ground nuts.

Pictou ; Pict means explosion of gas. Whenever in Micmac, the noun ends in the sound "kt," the regular form of the case locative is the addition of "*ook*." Pictook is equal to Pictou. Peter Toney, an educated Micmac, says there was once on a time a big fire which burned the tents of a large encampment, and always after the Indians referred to it as Muskeak Bucto (big fire) corrupted by the Whites into *Pictou*. Mr. Howe said Pictou means anything like a jar or bottle which has a narrow mouth and widens afterwards. Pictou Harbour does this; hence the name. It seems more than probable, from the coal found there and from the coal fires that have been burning in the region suggesting the likelihood of fires caused by lightning, that the root word means fire or some manifestation of fire.

Chebogue, N.S., from Itebogue, spring water.

Merigomish, N.S , from Micmac, *Mallegomichtk*—"hard wood grove."

In Nova Scotia and also in other provinces the Indian names were in some cases translated into the French by the French when they gained supremacy, and sometimes into English when in turn the English came to rule.

Apohech-Kumoochwakadi, "place of Black Duck," was translated by the French and called Riviere des Canards. The English to-day call it *Canard River*. Eel Brook is the English translation of the Indian *Oopt-omagogin*—"place for eels." Cranberry Head is simply the English of the Indian *Soonecatio*, "place for cranberries." *Membegwich* means "Little Harbour" and so the English call it Little Harbour.

In Nova Scotia a fair number of Indian names remain, though more might have been retained. A good many years

ago I picked up a torn newspaper. Examination showed it to contain some verses of poetry that seemed, both from the sentiment and the jingle, to be worthy of preservation. There was no name, assumed or real, of author attached to the poetry. I sent a copy to Beamish Murdock who embalmed the verses in his history of Nova Scotia without having been able to discover the author. I wrote to Angus Gidney, whose long experience on the Press and whose literary taste would likely enable him to throw light on the authorship, but neither he nor Mr. Calneck, to whom I also applied, could give any information. Lighthall mentions De Mill as probably the author. But De Mill when I asked him could give no clue. Rev. J. Campbell, who wrote a book on Yarmouth County, 1876, attributes it to " our esteemed fellow-citizen " Richard Huntingdon, with what degree of authority I know not. The verses themselves run as follows :—

The memory of the Redman
How can it pass away
While his names of music linger
On each mount and stream and bay;
While *Musquodoboit's* waters
Roll sparkling to the main,
While falls the laughing sunbeam
On *Chegogin's* fields of grain.

While floats our Country's banner
On *Chebucto's* glorious wave,
And the frowning cliffs of *Scatarie*
The trembling surges brave;
While breezy *Aspotogan*
Lifts high its summit blue;
And sparkles on its winding way
The gentle *Sissiboo.*

While *Escasoni's* fountains
Pour down their crystal tide;
While *Inganish's* mountains
Lift high their forms of pride;
Or while on *Mabou's* river
The boatman plies his oar;
Or the billows burst in thunder
On *Chicaben's* rock-girt shore,

The memory of the Redman !
It lingers like a spell
On many a storm-swept headland,
In many a leafy dell ;
Where *Tusket's* thousand islets
Like emeralds stud the deep ;
Where *Blomidon*, a sentry grim,
His endless watch doth keep.

It dwells round *Catalone's* blue lake
Mid leafy forests hid :
Round fair *Discouse* and the rushing tide
Of the turbid Pisiquid.
And it lends, *Chebogue*, a touching grace
To thy softly flowing river
As we sadly think of the gentle race
That has passed away forever.*

If we turn to the St. Lawrence River Provinces, we find the traces of the Indian everywhere. I can only give a few specimens and those in the briefest manner possible.

Quebec is Indian for the narrow strait formed by Cape Diamond jutting out into the river.

Ontario is Indian for a "beautiful prospect of hills and waters," or a corruption of the Indian word *Onitariio*, meaning "beautiful lake or waters," the appropriateness of which, as of every place-name given by Indians is at once apparent; and the same may be said of the early French names the environment being the same in both cases. It is a good deal more than can be said of our English place-names although we in Canada may fairly and proudly boast of having carefully abstained from imitating the barbarities of our cousins to the south of us. When the traveller asked the French native what the river in one of the Western States was called over which he was ferrying the stranger, the answer was Bloody Gulch," the Yankees call it ; with us it is *La Brunette*—'the brown river.'"

*Fortunately the poet's vaticinal fears have not been realized. In the provinces of Quebec, Ontario, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia there has been, under the wise and kindly care of the Government of Canada, acting through the Indian Department, an increase of 11,005 in the Indian population of those provinces during the past 25 years ; an increase of nearly 24 per cent.

Lake Erie is the *lake of the wild cats*, or as my friend *Dr. Bourinot says, the lake of the *Raccoon*, the Indians resorting in the ancient times to the region round about for raccoons. Lake *Huron* is the lake of the Indian-Huron tribe who seem to have cultivated shocks of hair, (French *Hure*,) similar to to those of certain African tribes with which we of the present time are familiar from our geographies or from personal observation. Lake *Michigan* is from the Indian Mishigan, meaning *monstrous lake;* and Lake *Nipissing* is Indian for *diminutive*, the lake being small by the side of the great lakes. *Kaministiquia* means *wide river*. *Manitoulin* is a Frenchification of the Indian word Manitouwahining—"*the dwelling place of spirits.*" Mattawa (Indian Mataowan) means "*place where two rivers meet.*" *Ottawa*, according to Father Arnaud, means "the place where the water boils and surges" and according to Rev. Mr. Beatty, it means the "River guards," the Ottawa tribe of Indians being so called by the Indians of Montreal because they guarded the river and prevented the irruption of the more northerly tribes into the regions at the mouth of the river. Mr. Sulte thinks the word means "men of the woods." *Penetanguishene* means "rolling of shining sands." *Toronto* means "place of meeting"—a name that well characterizes it to-day, as the boast is that it is the City of Conventions.

When the St. Lawrence River Indians referred to the Maritime Provinces they called the region "Abenakis," derived from *Waben*—"it is dawn" and Ykki, "land;" or "land of the dawn or east." The English, who are essentially water-men, have seized upon the other peculiarity and call them the Maritime region. But the "Dawn" land is a fine poetic name.

Abittibi; (*Abitt* meaning "middle." Nipig meaning "water)" the middle water, Lake Abittibi being half way between Nipissing Lake and James Bay.

Athabasca; Ayapp as Kais, meaning "there are rushes, reeds or herbs here and there."

Ka Kouna; Kâkwa means porcupine; nak, "at the;" equal to "The Porcupine's home."

Chicoutimi; *Ishko*, "up to where;" timiw, "it is deep." "The end of deep water."

Shawenegan; *Shavo*, "through," *nigan*, "tool," needle

* I am proud to know that since the above was written the Doctor has received the well merited honour of a K.C.M.G. from the Sovereign.

or awl; the fall of water having acted like a tool to pierce the rock.

Escoumains means the berry region.
Yamachiche means muddy bottom and shore.
Yamaska means shore covered with reeds.
Kamouraska means reedy shore.
Mingan means the wolf region.
Maskinonge means the house of the marvellous Pike.
Missisquoi means the home of the big woman.
Madawaska means river having its outlet among reeds.
Mistassini means large stone lake.
Miscouche means the bear country.
Saguenay means outflowing water.
Temiscouata means deep everywhere.
Tadousac means the hillock region.
Caughnawaga means at the rapids.
Quinte—Kahenta means meadow.
Hochelaga means Beaver Dam.

We must not longer dally with the beautiful Indian names beyond expressing a hope that the Post Office authorities, who are responsible for a great many place-names, will treat with tenderness any remaining Indian names, especially in the North West.

Time is left for only a few words about the 2nd class, the place-names memorizing men of local or Canadian fame.

George M. Dawson has, it seems to me, been especially careful to give prominence to our men of Canadian-made fame. Ogilvie's name has been blown about this pendant globe in connection with Canada's great treasure-house, the Klondike. He stands for honesty and trustworthiness—a civil servant of whom the Service and the Country may well be proud. We know now what he has been doing as an explorer. But George Dawson years ago gave a valley in the Yukon District the name of Ogilvie Valley in honor of William. Both Dawson and Ogilvie commemorated that genial Minister of the Interior, Thomas White—the first in Mount White and the second in White Pass.

Sir William Logan's memory enjoys the unique distinction of having five monuments, three of them mounts, more enduring than brass or marble. Mount Logan near Lake Francis in Yukon given by Dawson; Mount Logan near

Mount St. Elias and Mount Logan in Rimouski County by Murray. The fourth is an island in the Nipigon region, given by Bell in 1869, and the fifth is Logan Inlet in Queen Charlotte Islands.

Lake and River Labarge (Yukon) are named after Mike Labarge who was engaged in exploring, for the Western Union Telegraph Co., the river and adjacent territory in Yukon for the purpose of connecting Europe and America by telegraph through Canada, Alaska and across Behring Strait and on through Asia. The exploration took place in 1865-7. The successful laying of the Atlantic Cable in 1866 put an end to the project. Mike was on hand to greet Nansen in Montreal the other day. Telegraph Creek commemorates the same expedition. Mount Dawson, near Lake Labarge, and Dawson City are place-names which tell of one of the most indefatigable explorers of modern days, one whose career does honor to the Civil Service of Canada. The men of the Geological Survey are worthy of praise because they have in so many instances retained the Indian names.

In 1864 a notable gathering took place in the historical City of Quebec. There were gathered men from the provinces of Canada, (now Ontario and Quebec,) from Prince Edward Island, from Newfoundland, from New Brunswick and Nova Scotia. They met to see what could be done to bring about the amalgamation of British North America. To this gathering came the venerable Taché, the astute John A. Macdonald, the fiery Cartier, the splendid debater McDougall, the great Onontio George Brown, the able financier Galt, the shrewd Mowat, the eloquent McGee, the vehement Tupper, the suave Archibald, the trusted Tilley, the active Mitchell, the keen-minded Fisher and many others of whom time fails me to tell. They debated and discussed. Many suspicions were in the public mind. But in secrecy, as was necessary, they worked and hammered till they produced 72 resolutions which, after being fused in the alembic of the statute-shapers of the British Parliament, were placed upon the Imperial Statute book as the *Union Act of 1867*. Those who took part in this historical work have been remembered in the place-names Taché, Macdonald (municipality and mount) McDougall, Brown, Campbell, Mowat, Langevin, Tupper, Tilley, Archibald, Johnston and Chapais. There are some others whose names might well

be adopted as place-names and there are some—such as Galt and Cartier and Grey—whose names had already been employed before the Quebec Conference took place.

Morris in Manitoba commemorates Alexander Morris, a man who strove to make his country great and prosperous. De Salaberry, of whose good works Sulte has sung, is remembered in Salaberry in the French district of Provencher.

We recognize at once, in the place-names of Burpee and Bidwell and Billings and Dawson (ex M.P.) and Howland and Mills and Robinson and Sandfield and Brantford and Papineau, Lauder, Osler, Widdifield, Kirkpatrick, Hagerman, Blake, Lount, Himsworth, Chapleau, Schreiber—public men who have worked for the best interests of the country.

Of course this vein might be worked and results produced for a whole night. What has been said must suffice.

And yet we have but skirted the shores of the subject. An inexhaustible supply is untouched.

Some place-names are corruptions arising from misunderstanding of previous names. We have had place-names given by Basques, Portuguese, Spaniards, French and English. Some of these earlier place-name givers bestowed names that from the ignorance or carelessness of subsequent generations of different races have been subjected to much phonetic abrasion, and in some instances mutilated beyond all recognition. In London, Eng., under the operation of this factor there is *Sermon* Lane, the origin of which is traced to Shermonier's lane —the lane in which stood the office of the *money-shearers*, or clippers connected with the Mint. So in Canada a mountain near the head of the Bay of Fundy is known as the Shepody Mountain. The name (so say some) the French gave it was *Chapeau de dieu*, from the cap of cloud which often overhangs it. The English who followed continued the name as Chipody and later as Shepody.

Down in the Gulf of St. Lawrence forming the most easterly point of the north shore of Baie des Chaleurs is Cape d'Espoir, so named because it was a welcome sight to early French fishermen who had lost their bearings in a storm. The English call it *Cape Despair* and the lugubrious change is reported to have been intentional having been caused by the total loss there of an English troopship carrying a portion of Sir Hovenden Walker's squadron in 1711. We have added to our list of post offices in this very year of grace, 1897, the post office of Cape Despair.

One of the gates in the picturesque City of Quebec was called the *Hope* gate, after one of the Hope family. The French christened it *Porte de l'Esperance.*

Cap Faim, commemorative no doubt of an unpleasant experience of hunger by a band of early navigators, has, under the phonetic spell of English sailors, been transformed into Cape Fame.

Sir James Le Moine tells how one Shepard built a villa and called it Shepardville, near the City of Quebec, and around it in time clustered some *habitants'* houses. To the cluster the French gave the name Bergerville, translating the English word "shepherd" into the French vernacular, as was natural. Subsequently, Irish settlers multiplied and with characteristic *insouciance* they called the place *Beggarsville.* Once again the French got the upper hand, and, with characteristic politeness, translated the Irish name into "Village des Queteux," not *village des gueux*—the village of the almstakers, not the village of the beggars—a nice distinction.

Cape Speer in Newfoundland was originally Cap-da-Espera, Portuguese for Cape Hope. Nobody sees even a homeopathic scintilla of *hope* in its present name. Cape Raz was Portuguese for Flat Cape. Its present name, Cape Race, carries with it no suggestion of flatness. Cape Ray comes from the Basque word *arraico* meaning "approach," the point for turning has been reached." It is Ray by corruption. It would need a Roentgen Ray to uncover its original.

Some place-names have a singular power of asserting themselves against persistent efforts to change them; thus, Basin Minas was originally so called. It then became, in French, Basin Mines, but as there were no mines in the vicinity it has got back to its original Portuguese rendering, Minas, "where there are springs."

Bay of Fuudy was originally Baya Funda, Portuguese for Deep Bay. The French called it La Baie Francaise. But its original name clung to it in spite of the long French occupation of Acadia.

Imagination, a lively fancy, plays a not inconsiderable part in the efforts to account for many plaee-names. Thus one of the fanciful derivations of the word "Quebec" is "O! *quel bec*" freely translated "O! what a beak," supposed to have been uttered by the French sailors when they first saw

the giant headland looming up as mysterious as the great *roc* of "The Arabian Nights."

In New Brunswick a river is called, in local parlance, Ken-ne-bec-ay'shus, and local tradition, in endeavoring to account for the name, affirms that once on a time when the river banks and the adjacent country were covered with a dense forest there stood on the clearing, before the river, a tavern, the proprietor of which was named *Casey*. Two travellers in a terrible storm pushed on their way and coming suddenly upon the house thought of the comfort the inn and its accompanying "hot toddy" would afford and asked each other with incredulous joy, "Can it be Casey's?" Hence, of course, the name.

There are two mountains near the border line of the two fine counties of Colchester and Pictou in Nova Scotia, Mount Thom, and Mount Ephraim. Local tradition gives the following account of the origin of these place-names. The early settlers of Truro, Nova Scotia, came from New Hampshire (New England) and for a time lived in great terror of the Indians and accordingly they resorted at night to a stockaded fort where they might sleep without dreaming of wild Indians, war-hoops, tomahawks and scalping knives. On one occasion word was sent to them from Halifax warning them of the hostile intentions of a large band of Indians in camp at or near Pictou. The settlers resolved upon sending scouts across the river to find out. Tom Archibald, Ephraim Howard and John Oughterson volunteered for the service. After journeying for some time through the dense forest they came to a hill according to their calculations not far from Pictou. Selecting the tallest tree Oughterson said to Archibald "Mount, Tom." Tom in obedience to the order mounted the tree. Not seeing the water from his lofty perch, he so reported and the trio travelled some distance further and came to another hill where they repeated the effort to see salt water, only on this occasion the command was addressed to Howard, "Mount, Ephraim." On their return to Truro they described the incidents of their expedition and among these were the tree-mounting exploits. Naturally the hill where Tom climbed the tree became known as Thom's Mount and the other as Ephraim's Mount. Hence to this day Mount Thom and Mount Ephraim remain the distinguishing place-names of these two elevations.

I have thus very imperfectly given a partial view of the

place-names of Canada. It will be in the future increasingly difficult to bestow appropriate place-names. Now that we are one country we must avoid the duplications that have come to us as a legacy from the ante-confederation period. Perforce, the fund of appropriate names from France and Great Britain nears the bottom. We have not by any means exhausted the names of the saints in the Roman and Saxon Hagiologies but as we had 499 places in the Census commemorative of these worthies and have a good many more of them outside of the Census lists it is plain that we cannot depend much longer upon the saints to supply us with place-names.*

The finer taste of modern times requires that we do not imitate our neighbors and hunt in ancient Greek history for such names as Athens, Troy, Tyre, Sidon, or give such fantastic names as Tomb City, Henpeck City and the like. The practical tendency of the age is opposed to names having an eponymic† existence. Isaac Taylor, already quoted, says, "If the true principles of Anglo-Saxon nomenclature were understood our Anglo-American and Australian cousins might construct an endless series of fresh names which might be at once harmonious, distinctive, characteristic and in entire consonance with the genius of the language."

I suggest that it would be a step in the right direction for the Government to appoint a permanent commission of three or more competent persons to provide the new place-names we are continually needing.

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*The extent to which Canadians were a maritime people, in the early years, is seen in the fact that there are, in the Dominion, 55 places to which the name of Ste. Anne, the Patron Saint of sailors, has been given.

†A personal name evolved by popular speculation to account for some geographical term the true meaning of which has not been understood; as the speculation that France takes its name from Francus, a son of Hector; and Britain from Brydain, a son of Aenius; and Scotland from Scotia, a daughter of Pharoah.

P. S.--Page 44, line 5. Since writing that the C. P. Ry. is responsible for the place name of Mount Macdonald, I found from official reports that this Mountain, as well as others, was named by Mr. Otto J. Klotz, our efficient President, who was the first to triangulate the mountains in the Rockies and Selkirks along the route of the C. P. Ry.

G. J.

The Fur Seal of the North Pacific.

J. M. MACOUN.

Assistant Naturalist to the Geol. Survey of Canada.

[*Read March 4th, 1898.*

The principal resorts of the Fur-seals of the North Pacific (*Callorhinus ursinus*) are the Commander Islands near the Kamchatkan Coast and the Pribylov Islands in Lat. 56° on the eastern side of Behring Sea. They were at one time found in large numbers on some of the more northern of the Kurile Islands and on several small islands between Kamchatka and the Asiatic mainland, but being unprotected have been on these islands almost exterminated. The seals frequenting the Commander Islands differ in no essential respect from those found on the Pribylov Islands. They have the same habits, eat the same food and meet the same fate as the Alaskan seal so that in order to restrict my paper to reasonable limits I shall speak only of the latter animals.

Though the Pribylov Islands were not discovered until 1786, Russian explorers and traders had for nearly fifty years been searching for the breeding places of the fur-seal that at certain seasons were very abundant in the passes of the Aleutian Islands and along the Alaskan coast. When Pribylov landed on St. George Island, one of the group which bears his name, he found no trace of the island ever having been inhabited by man and it is due principally to this fact that they were the chosen haunt of the fur-seals. Here for thousands of years they had been unmolested, and if in earlier times they bred on the Aleutian Islands further south they had long before been exterminated by the inhabitants of these islands who passed freely from one island to another in their skin canoes and boats.

The Pribylov Islands are not so barren and bleak as they are generally supposed to be. Except where the rocks have not yet been covered with soil the ground is everywhere hidden by a luxuriant growth of grass interspersed with beautiful flowers. Though the hours of sunshine are few in summer this does not affect the coloring of the blossoms, for I have nowhere seen deeper, richer colors than are exhibited by the flowers growing on the Pribylov Islands. Blues and yellows of every imaginable shade predominate, the light yellow of the Poppy contrasting with the orange rays of the Arnica and the Dandelion, and the pale blue of the Polemonium with the very dark blossoms of the Monkshood.

The number of species is not great, only about 150, and of these only some 50 species are at all conspicuous, but these make up in individual numbers for the paucity of species. They are so mixed together, however, that without studying them attentively one is apt to imagine the number of species to be much greater than is really the case.

Pribylov, in the name of the Russian government, took possession of the islands he had discovered, and from 1786 until 1867 they were owned by Russia. With the cession of Alaska they passed into the possession of the United States. Reliable statistics are not available for the earlier years of the Russian control of the islands, but it is known that at least 1,000,000 skins were taken from them between 1798 and 1821, and about the same number was marketed between 1821 and 1867. The method of killing, and curing the skins will be dealt with in another section of this paper.

The islands being uninhabited, the Russians when they began to kill the seals transported several hundred natives from the Aleutian Islands to the Pribylov Islands. Here these people built for themselves sod huts or barabaras such as they had always lived in. There was no improvement in this respect until the U.S. control, when comfortable modern houses were built for all the natives. In many other respects, too, their condition has been improved, they have been taught habits of cleanliness and economy, and nearly all of them read and speak English though they still retain the Russian religion. One of the stipulations made by Russia when the islands were sold to the United States was that no other church should be established there. During the sealing season from June 18th to August 1st, these people work very hard, but throughout the rest of the year they live in absolute

idleness. A government agent regulates the amount of goods of various sorts which each may purchase, including provisions and clothing, so that there is no waste. The climate admits of no agricultural pursuit, and the islands being without timber there is no work of any kind upon which the natives can be employed.

Before entering into a detailed description of the seals and their habits some of the special terms by which they are classified in the islands may be defined.

The young of the fur-seal are called " pups," the mature females are called "cows," the young male seals between 2 and 4 years are known as "bachelors or holluschickie," and the mature males as "bulls." The seals when on the islands are divided naturally into two classes, the breeding seals going upon the rookeries, and the bachelors on the hauling-grounds. Upon the rookeries the mature seals congregate and here the young are born. The hauling-grounds are usually, though not always, close to the rookeries. Here the young male seals are to be found when ashore, and from these hauling-grounds the seals killed on the islands are driven.

The first bull reaches the islands about May 1st and between that time and May 15th they come ashore in increasing numbers, by June 1st nearly all have arrived and taken up stations on the rookeries—from 20 to 50 feet apart on the more crowded rookeries; at greater distances on the less compact ones. During the whole month of May and the first week in June fights between these bulls are frequent, but though sometimes terribly torn they seldom kill one another. From the date of his arrival until the rookeries break up in August the bull seal does not leave his harem. During that time—about three months—he neither eats nor drinks and never sleeps for more than a minute or two at a time. The mature bull weighs between 400 and 600 pounds, the specimen at the museum of the Geological Survey being about the average size.

The first cow arrives about the middle of June and the number gradually increases until July 15th when the rookeries are said to be at their height, that is there are more cows upon them at that time than at any other. As the cows come ashore they are sometimes caught by waiting bulls and driven or pulled into their harems, but as a general rule the cow goes where she pleases and is very apt to join a harem in which several other cows have already congregated The fur-seal,

as you are all aware, is a polygamous animal, harems of from two to fifty and sometimes 100 cows being formed around individual males. The young are born very soon after the arrival of the cows and soon form themselves into little groups, or "pods" as they are called on the islands. They spend their time in sleep and play, and grow rapidly. They can swim when first born but do not go into the sea of their own accord until a month or six weeks old, when on calm days the greater part of their time is spent swimming and playing in the water in front of the rookeries. A little later they go long distances from the rookeries on which they were born and haul-out in great numbers on the shores of quiet bays.

The earliest date on which I have seen pups swimming was July 18th, 1892. The day was bright and warm and the tide at the time I first noticed them was just beginning to flow. A great many pups were playing in the pools among the rocks near the edge of the sea; in one place there were 40 or 50 together and in many others more than half that number, while all along the shore the young seals were in little groups of from 3 to 10. No old seals were near them but those swimming about in the water and those going to and coming from it. As the tide came in some of the pups slowly retreated, but many of them remained among the rocks until the water was some distance beyond them. They played about and swam from one rock to another and back many times with no appreciable interval of rest. I neither at this time nor on any other occasion, saw an old seal attempt to teach a pup to swim nor carry it to the water, nor have I ever seen anything that would lead one to suppose that pups *learned* to swim. On the contrary a pup cut from its mother can swim a long time.

The length of time a pup is dependent upon its mother has never been satisfactorily ascertained. It is known that they begin to secure food from the sea long before they leave the islands in the autumn, but they have also been killed very late in the season with their stomachs full of milk. So long as the mother seal remains on or near the islands and her pup can find her he doubtless receives nourishment from her, but if left to his own resources he will generally be able to secure food for himself. I do not hesitate to say that a strong pup six weeks old that goes freely into the water can secure food for himself, up to that time he is probably dependent upon his mother, though promiscuous nursing is not unknown.

While speaking of the young seals reference may be made to the known causes of their destruction and the supposed effects of pelagic sealing. Dead pups were never noted in large numbers on the Pribylov Islands until 1891 when several thousand were found on one rookery by the British Commissioners. Dr. Geo. M. Dawson and Sir George Baden-Powell, the U. S. Treasury Agents on the islands, could not at first account for this great mortality, but finally attributed it to pelagic sealing. The mothers of these pups had been killed at sea they said, and the young had died of starvation. This hypothesis was made the basis of one section of the United States case and although shown to be untenable is still maintained. It was shown by the British Commissioners that in 1891 pelagic sealing had under the *modus vivendi* of that year ceased long before the date at which the pups seen by them died, but it was still maintained by the United States that pelagic sealing was the cause of the mortality. In 1892 no seals were killed by pelagic sealers in Behring Sea, but in that year I found an even greater number of dead pups on the rookeries. Sealing at sea had evidently not caused the death of these pups, and this was the view taken by the arbitrators at Paris in 1892. None of the natural causes of destruction known to us seemed adequate to explain this great mortality. Those that came under our observation were trampling or crushing by older seals, drowning, straying away from their home rookeries, and a few minor causes. None of these explained the deaths of large numbers of young seals on restricted areas and though no trace of an epidemic could be found this explanation first advanced by the British Commissioners seemed the only reasonable one. In 1896, in company with Dr. Jordan, the U. S. Commissioner, I counted over 11,000 dead pups on the rookeries before pelagic sealing began. Later in the season—in October—we again counted the dead pups and found that about the same number had died since the date of our first count early in August. Ignoring the fact that whatever the causes of death might have been early in the season they were probably in operation throughout the season, it was assumed by the agents of the United States that these later deaths were all due to starvation. No new cause of destruction was found in 1896, Dr. Jordan being of the opinion that the principal cause of death was trampling by older seals. In 1897, however, acting upon the suggestion of Dr. Styles, of Washington, we discovered that the chief cause of death was a small parasitic worm, a species of Uncin-

aria found in great numbers in the intestines of the young seals. It attacks the intestinal walls and destroys them, thus causing congestion and subsequent death. The deaths of nearly all the pups examined were due to this worm, and though we left the islands early in August and could not determine whether as many young died from this cause late in the season as in early August there is no reason to doubt that such is the case. The proportion of pups that starve to death has not yet been even roughly determined.

The great similarity in the appearance of female seals makes it difficult, if not wholly impossible, to determine with any degree of accuracy the movements of individuals. For this reason no definite statement can be made as to how frequently they go into the water, how long they remain there, or how often they suckle their young. It is known that for the first two weeks, or longer, after a pup is born its mother does not leave it. After that as the pup grows older and is suckled less frequently, the mother seals go into the water and hundreds of them may be seen any day playing and swimming about near the rookeries. Like the males they require food only at long intervals and when it is needed it can be procured within a very few miles of the rookeries. Under the Paris Regulations no seals may be killed at sea within 60 miles of the breeding islands and this protected area affords in my opinion ample protection to the nursing mothers, though doubtless they do sometimes, perhaps frequently, go a greater distance from the land, though it is not necessary to do so in order to procure food. Pelagic sealers report the taking of many seals in milk at long distances from the islands, and Mr. Andrew Halkett, whose admirable report on his investigations at sea in 1896, I have had an opportunity of reading, reports a very large percentage of this class of seals among those taken by the schooner upon which he lived. The wide variance between the percentage of females in milk taken by different schooners shows that this class of seals is much more numerous in some parts of Behring Sea than in others. Many of these females are the mothers of the young who died upon the rookeries from the effects of the Uncinaria and other causes, and of course the killing of such females entails no further loss. Many others are killed after the young are able to sustain themselves and no starvation of pups follows the killing of such mothers. Some pups undoubtedly die of starvation but the number is small and even when the mother is killed before the young one can pro-

cure food from the sea it not infrequently secures nourishment from other females. Several such cases have been noted by me.

When on their rookeries the seals exhibit little fear at the approach of man, but as they see badly, a large moving body will sometimes frighten them and cause a stampede. One may approach within a few yards of them, however, if one moves carefully with no undue noise and I have frequently sat for hours with seals on all sides of me, old and young frequently coming within touching distance. It was sometimes necessary to drive them all from the rookery when a count of dead seals was to be made, and on such occasions it was often impossible to move the old bulls though clubs and stones were freely used. A cow will occasionally stand as resolutely at bay but no danger is to be anticipated from her. A bull will sometimes charge, however, and safety lies then only in fleetness of foot. No blow short of one that would actually stun or kill him will stop a bull that has made up his mind to vindicate his supposed rights. So well is this understood that on one occasion last year when we were counting pups a bull chased Mr. Clarke, Dr. Jordan's assistant, and his retreat being cut off he jumped from a low cliff into the sea rather than attempt to defend himself against the enraged bull.

The life of the young bachelor or holluschickie would be a happy one were it not that throughout the whole sealing season he is driven and re-driven to the killing grounds and if he escapes with his life has, at least, to undergo the fatiguing and injurious process of being driven long distances over land. As I have already said, the young male seals herd together, congregating in large numbers on what are called hauling-grounds, either in the immediate vicinity of the breeding rookeries or at some distance from them. Until the killing season begins, about June 15, they are unmolested, go freely to and from the sea and spend their whole time in sleep and play. They are known to take food during the summer, but with them as with the older seals, long intervals elapse between meals. With the opening of the killing season their troubles begin. Drives are made from all the hauling-grounds every few days, from some of them almost daily. These drives are made by the native Aleuts in the employ of the sealing company, but under an agent of the United States Government. Between midnight and 2 o'clock according to the distance the seals are to be driven, a party of men goes to the

hauling-ground; some of them steal quietly between the seals and the water or between the young males and the breeding seals if the drive is made from behind a rookery. Great care is taken to prevent stampedes, as when once thoroughly frightened the seals cannot be controlled. They are not hurried and a very few men suffice to prevent any lateral movement. If the morning be warm they cannot be driven at all and sometimes drives are not finished, the seals being allowed to return to the hauling-grounds or to the water. The killing-ground is usually reached between 3 and 5 o'clock in the morning, and the killing is begun as soon as the seals have cooled off. A pod or bunch of between 20 and 40 seals is separated from the band and driven to where the clubbers await them. They are killed with long clubs much the shape of a base-ball bat, but about twice the length. Five or six clubbers surround the pod that has been driven to them, the agent of the sealing company points out the seals he believes to be of the size to afford the best skins and they are quickly dispatched by a blow or two of the club. The natives who do this work are exceedingly skilful, and seldom miss the seal pointed out to them or strike another. When clubbed the seals are dragged aside by the skinners and a fresh pod driven up. After being clubbed each seal is stuck with a knife to ensure its being dead, and after cooling for a few minutes is quickly skinned. In this too, the natives are remarkably expert, some of them being able to remove the skin in less than one minute. The seals which are thought too large or too small, or whose skins appear to have been injured, are allowed to escape and ultimately reach the sea; many of them return to the hauling-grounds whence they are again driven. This process of re-driving cannot be otherwise than injurious to them, but while the present methods are practiced there seems to be no way of obviating it. After all the seals have been killed and skinned (and more than a thousand are often killed during one morning) the skins are taken to the salt-house when after being counted they are salted. They are laid flat on the floor, care being taken that the edges are not turned in, salt is then shovelled over them until they are completely covered, when another layer of skins is laid down and so on until the kench or bin in which they have been placed is full. In ten days or two weeks, they are taken from the salt, well shaken, and then re-salted. A week or two later they are ready for bundling. Two skins are laid face to face with the fur outwards, the edges are turned in and then rolled

into a complete bundle about the diameter of a stove-pipe and about 18 inches long. The bundle is securely tied with a stout cord and the skins are then ready for shipment. In that condition they reach London where they are again sorted, and divided into sizes and sold by auction in their salted raw condition. The dressing of seal-skins is done almost exclusively by one London firm. The process differs from that used in dressing all other skins. The longer, coarser hairs penetrate a little further into the skin than do the finer softer ones which constitute the fur. The under-side of the skin is carefully scraped until the ends of the longer hairs are cut when they are easily removed. The skins are then dyed and are ready to be made into garments.

The native seal-killer on the islands knows nothing of all this, however, and is concerned only with the work of killing the seals and the consequent feasting such an ample supply of fresh meat affords him. While the men are busy clubbing and skinning the seals, the women and children are employed in cutting off the best parts of the carcase for use as food. All parts of the seal are eaten, tongue, heart and liver, as well as the solid flesh. A part of what is not consumed during the summer is dried for winter use, though the process is a long one on account of the prevailing foggy or wet weather, and the drying meat is unsavoury to a white man, both in appearance and odour. At the table of the sealing company such meat is served in some form at every meal. As dressed by cooks of experience it is very palatable, though rather gamy in flavour. The liver, is particularly good, at least those who are fond of liver say so.

The seals begin to leave the breeding islands in October and by the middle of November all the cows and pups have gone. The bulls, or at least some of them, remain on the islands until the first heavy snow-fall when they, too, disappear. Very little is known of the fur-seal when at sea during the winter. They spread over the whole North Pacific Ocean, being occasionally found as far south as the Sandwich Islands. In early January they come in near the coast and are during that month found along the whole coast line between San Francisco and Vancouver Island, not however, coming in recent years very near the shore, though formerly they were found in large numbers about New Years in some of the bays on the west coast of Vancouver Island. During February and March they move gradually northward following the general trend of the coast and during April and early

May are found in great numbers west and north-west of Sitka, on what are called by the pelagic sealers the Fairweather grounds. They move more quickly after leaving that part of the ocean and are supposed to go straight to the Pribylov Islands. While at sea the only animal known to prey upon the fur-seal is the Great Orca, or killer-whale, as it is popularly called. Whether these animals destroy many fur-seals in mid-ocean cannot be determined, but the seals are scattered over so wide an area that it is probable that the number killed by the *Orca* is not great. Before the seals leave the islands in the autumn, however, the killer destroys a great many of the pups. They come close up to the land and swimming in among the young seals seize them and kill them at a single bite. Many pups are killed apparently through pure wantonness, though many of them are eaten. It is not probable that many of the older seals die from any other cause but old age while they are absent from the islands. They feed upon squid and all kinds of surface-swimming fish, and swim so rapidly and can go such a long time without food that it is not at all probable that many of them die from starvation. Nor can rough weather have any effect upon them, as from the time the young seals first go into the water they delight to play among the breakers and in heavy seas, and are so essentially an aquatic animal that the roughest weather, no matter how long continued would fail to injure them.

While absent from the islands the only known destructive agency of importance is pelagic sealing. From January until May in the North Pacific Ocean and from the 1st of August until the weather grows rough, in Behring Sea the seal is killed in large numbers by the pelagic hunter. A short account of his methods may not be without interest. The Canadian sealing schooners are for the most part fitted out in Victoria. If white hunters are employed they also are engaged there, but if the hunting is to be done by Indians, the schooner after having been provisioned sails to the west coast of Vancouuer Island where most of the Indian hunters live. These schooners are of all sizes, the best of them averaging about 100 tons. If white hunters are employed boats are used, if Indians, canoes. The boats are peculiarly adapted for sealing and have been specially modelled to serve the purpose for which they are intended, being the same shape at both ends, either end thus serving as bow. Outside of Behring Sea guns may be used. When hunting with the gun the hunter stands in the centre of the boat, both of the boat-pullers facing

him, one pulling with his back the other with his face towards the bow. When a seal is seen the boat is rowed gently towards it the man facing the bow acting as steersman. If the seal dives and comes up in the rear of the boat it is not necessary to turn it, the bowman then becoming steersman. The hunter never fires except at very short range and seals that have been hit are with rare exceptions secured. The prohibition of the use of fire-arms in Behring Sea has led to a more general use of the spear by white hunters. It has always been the favorite weapon of the Indian. When hunting with the spear the white hunter stands in the bow of the boat. Indians use canoes almost exclusively. Two men form a crew, the bowsman acting as hunter. Each schooner carries from ten to twenty, sometimes more, boats or canoes.

The life of the pelagic seal hunters is in every respect a hard one. On board the schooner his quarters are crowded and his fare often poor. He is allowed to remain on board only in the very roughest weather, any day on which the boats may be lowered with safety being considered a suitable one for hunting. On leaving the vessel the boats nearly always form in line so that each may have a clear space to windward. The schooner remains as near as possible stationary during the day, sometimes slowly following in the wake of the boats, though if the weather be calm they work towards all points of the compass and then, of course, the vessel moves as little as possible. Often in the North Pacific and nearly always in Behring Sea the fog is so dense that the vessel can be distinguished only a few yards away, but these hardy adventurous men, taking their lives in their hands set out to look for seals with the same unconcern as if the day were clear. In such weather a fog-horn is blown on the schooner towards evening or a bomb-gun fired, but even with these precautions boats frequently fail to reach the schooner until the following day and some of them not at all. The methods of salting and curing the skins on board these vessels are as nearly like those pursued on the islands as the restricted room and tossing vessel will allow.

While only young male seals are killed on the islands, the pelagic sealer from the very nature of his methods of hunting is compelled to kill male and female indiscriminately, the sexes not being distinguishable when the seals are in the water. That this is the case has been made the basis of innumerable attacks upon pelagic sealing, not alone by those interested in the Behring Sea controversy, but by uninterested

parties who maintain that such methods of killing are inhuman and barbarous and ought not to be allowed. Those who use this argument forget that this has been the method pursued in the taking of all fur-bearing animals. More beaver are trapped every year than there are fur-seals killed at sea, and females as well as males are of course taken in this way, and so with fur-bearing animals of all kinds, but no one ever thinks of asking that the killing of such animals be prohibited on that account. So, too, with all domestic animals used for food, who thinks of asking when eating beef, mutton or pork whether the animal whose flesh he is consuming was a male or a female? With regard to the fur-seal, however, it is claimed that since it is a polygamuous animal and males may be killed on the islands without undue disturbance of the females, that that method alone should be pursued. There is ample evidence that this is not the case. Long before pelagic sealing could have had any effect upon the condition of the seal rookeries, a great decrease was noted in the number of seals of both sexes on the islands. This decrease can be attributed to no other cause than the excessive killing of male seals, the annual quota of 100,000 leaving an insufficient number to mature for procreative purposes.

This aspect of the seal question has been dealt with in my own reports and those of the British Behring Sea Commissioners, where all the facts which go to show that the decrease in the number of fur-seals is due not to pelagic sealing but to the methods pursued on the Pribylov Islands as enumerated and discussed.

The Yukon and its Gold Resources.

By William Ogilvie, Administrator of the Yukon.

Extract.

[*Read Feb. 18th, 1898.*

Of the two most southerly branches of the Yukon, the westerly, known as the Lewes, heads at the summit of the Dyea (or Chilkoot Pass,) in north latitude 59° 49′, approximately, and west longtitude 135° 13′; the other, known as Teslin, takes its rise somewhere between 131° and 132° west longtitude and about 59° 40′ north latitude.

These two streams are, at the present time, the principal routes of entrance to the Yukon valley—the first named, so far, absorbing most of the traffic. They are about equal in length—something under 200 miles—and about the same distance below the junction, another stream, the Pelly, joins. Teslin is navigable for almost its entire length. The Lewes is broken by the Canon and White Horse Rapids about 100 miles from its head. Small steamers have been run down through these, but it would be a very difficult task to get one up, in fact, practically impossible. Below their confluence, about 120 miles, we meet the Five Finger Rapids of the miners. This, however, is not an insuperable barrier to ordinary steamboat navigation, simply requiring the aid of a powerful line for about 200 yards. From this point to the mouth of the Yukon, about 2,000 miles, no further obstacle occurs. This river, with its confluents, so far as at present known, aggregates about 3,200 miles of navigable water—that is, navigable for ordinary, light-draft, stern-wheel steamers. Of this distance the main stream, taking either the Dyea

or Teslin branch, and from their junction to the mouth, has upwards of 2,000 miles, the other 1,200 miles being on the confluents.

As far as can be traced from our present knowledge, the valley in Canadian territory affords 6,000 miles of river, stream and gulch, of which about 1,400 are navigable for the class of steamers suited to the region. In this territory, which I consider by far the most important part of the Yukon valley, we find gold profusely scattered; in fact, it would be difficult to select a single mile on which traces are not found. I do not wish to be understood as saying that all this is rich or will pay for developing, far from it, but we know now that about half of it affords good indications—good enough to warrant us in assuming that it will be worked under more favorable conditions than at present exist. Out of this 3,000 miles not more that than 400 or 500 have been thoroughly prospected and developed, and in those 400 or 500 we have found the world-renowned Klondike region, which probably, all told, comprises less than 150 miles of river, stream and gulch.

The Stewart, with its confluents, furnishes nearly 2,000 linear miles of gold-bearing territory. This will average possibly less than ¼ of a mile in width. At present much of this we know is good.

The Pelly, up to the time of speaking, is practically unknown. A little prospecting has been done at several points with the result that, though not considered rich, it is an asset in the gold production of the future.

Outside of the Yukon valley in the more south westerly portion of this district, gold has been found on streams tributary to the Alsek River, from which we may reasonably conclude that the whole Yukon territory is more or less gold-bearing and will probably afford 7,000 linear miles of auriferous deposit, of which we may assume say one-half as worth developing; not at present it may be, in part, but with increased facilities for transport there can be very little doubt but that it will be utilized. These remarks refer, of course, to auriferous gravels and earths. When we take into consideration quartz, the possibilities can only be imagined. At present there are upwards of a dozen gold-bearing quartz lodes located in the vicinity of Forty Mile and Dawson, low-grade in quality but vast in extent. It is only reasonable to infer that, where gold is so universally and widely scattered, a portion of it at least must remain in the *in situ* mother lode, and

we may go further and say it does so remain at many points. The discovery and development of these points will naturally follow from the discovery and development of the auriferous gravels.

Other metals have been found at several points in the territory, notably silver-bearing galena in the vicinity of Forty Mile; silver ore itself in the vicinity of the lakes at the head of the Lewes; copper on White River; and traces of copper along the Yukon and Forty Mile. The richest gold deposits, so far as at present known, have been found running in a curved line following the general trend of the Pacific coast several hundred miles inland. Just east of this zone there is a sharp change in the geological character of the country from the older metalliferous rocks to the newer and comparatively recent cretaceous system. It is worthy of note that the richest deposits have so far been found on the borders of the change of system.

Convenient to the auriferous gravels and in these cretaceous rocks there are immense deposits of coal. Of this coal specimens have been analyzed and pronounced a very good quality of lignite. Whenever fuel is required for the development of the quartz lodes that will be found, coal is abundantly convenient, and it is only a question of months until this is utilized as the fuel of the country.

The other resources of the country are few, the principal one being timber, which need not, however, be mentioned, except so far as the requirements of the country itself are concerned, and even in that direction I very much fear the supply is stinted. A great deal of it is consumed in what the miners term "burning," i. e. thawing the ground in which the gold is found, the normal condition of the entire region being eternal frost from say two feet below the surface, and every shovelful of dirt brought from levels lower than that has first to be thawed. Under the present system of thawing nine-tenths of the heat developed by the combustion of the wood is wasted, with the result that along the auriferous streams timber very soon entirely disappears. The timbered area is confined exclusively to the valleys of the rivers, streams and gulches, and very seldom extends more than a quarter of a mile in width, that is, what might be termed commercial timber. The sides of the hills are covered with a thick growth of scrub shrubbery which in the distance charms the eye, but is totally unfit for practical use. This I think gives rise to the glowing accounts we sometimes read of the timber

resources of that region, as strangers passing down the river in a boat, see, as far as the eye can carry, both sides of the valley verdure clad, all of which they assume to be as important as that immediately adjacent to the stream, which generally is of fair size and of good quality. A tramp landward from the river would soon disabuse their minds of this idea.

To sum up, we may say that of the 7,000 miles of river, stream and gulch, which we have assumed exist in the Yukon district, at least five sixths are more or less timbered with timber of practical use, the belt having an average width of say a quarter of a mile, which gives us, approximately, about 1,500 square miles of timbered territory. At the present rate of consumption for mining purposes, building, and lumber for boats and other necessities, this will only last a few years. It is important, therefore, that it should be husbanded as far as possible, but that, as a question of administration, hardly concerns us here.

The general surface of the country is rugged, bleak and sterile; the sides and summits of the ridges and ranges from about 1,500 feet above the streams are bare. Below that, as already intimated, there is a thick growth of scrub and shrubbery, through which it is often extremely difficult to force one's way.

The winter, it might be said, begins in the last half of October and lasts until the middle of May. Ice commences running in the streams about the first date, and generally lasts until the latter date. This gives us nearly seven months of winter, during the greater portion of which the temperature often runs below—40°, and, during three months, borders on—60° or even below it. The attached table shows what may be expected.

In conclusion, I would say the region is not at all inviting, and its food resources may be said to be *nil*. Travel is exceedingly difficult and laborious. Insect pests, especially mosquitoes, are a veritable curse; and the long, dreary winters with their very short days are depressing. Still, to those who have hardihood, pluck and patience, there may be a rich reward for a few years' stays there. Hundreds have found it so, and thousands of others may venture with like expectations.

Year.	Mon
1887	Aug
	Sep
	Oct
	Nov
	Dec
1888	Jan
	Feb
	Mar
	Apr
	May
1895	Aug
	Sep
	Oct
	Nov
	Dec
1896	Jan
	Feb
	Mar
	Apr
	May
	Jun
	Jul
	Aug
	Sep
	Oct
	Nov
	Dec
1897	Jan
	Feb
	Mar
	Apr

METEOROLOGICAL RECORD IN THE YUKON DISTRICT.

Year.	Month.	TEMPERATURE.				NUMBER OF TIMES.							
		Mean Minimum.	Mean Maximum.	Highest.	Lowest.	32 degs. and below.	Zero and below.	— 10 degs. and below.	—20 degs. and below.	— 30 degs. and below.	— 40 degs. and below.	—50 degs. and below.	— 60 degs. and below.
1887	Aug.	30·9 dgs			21·6 dgs	4							
	Sept.	31·7 "			16·0 "	18							
	Oct.	18·5 "			1·0 "	31							
	Nov.	— 5·1 "			—21·1 "	31	22	12	3				
	Dec.	—33·6 "	—27·6 dgs	10·5 dgs	—55·1 "	31	31	29	26	19	14	4	
1888	Jan.	—25·3 "	—15·3 "	13·0 "	—53·5 "	31	27	23	19	16	7	3	
	Feb.	—16·8 "	— 4·3 "	21·2 "	—52·7 "	29	21	17	11	7	6	1	
	March	—11·5 "			—52·7 "	26	19	13	6	5	4	1	
	April	—20·1 "			—37·7 "	29	28	23	13	7			
	May	19·8 "	13·3 "	55·0 "	— 1·8 "	30	1						
1895	Aug.	40·1 "			28·0 "	6							
	Sept.	30·9 "			21·5 "	18							
	Oct.	19·4 "			12·7 "	29	1	1					
	Nov.	4·2 "	11·9 "	38·5 "	—36·3 "	30	12	3	1	1			
	Dec.	—18·2 "	—13·8 "	6·0 "	—55·1 "	31	29	20	10	6	3	1	
1896	Jan.	—41·9 "	—33·0 "	6·0 "	—67·9 "	31	31	29	25	24	15	12	5
	Feb.	—25·5 "	— 11·6 "	32·0 "	64·8 "	29	27	24	16	11	10	2	2
	March	— 2·4 "	18·1 "	39·5 "	—37·3 "	31	20	6	3	1			
	April	2·0 "	21·0 "	49·0 "	—28·1 "	28	15	10	8				
	May	28·8 "	48·7 "	62·0 "	5·0 "	18							
	June	39·8 "	65·1 "	80·0 "	27·8 "	1							
	July	41·5 "	68·9 "	81·0 "	33·0 "								
	Aug.	42·1 "	62·6 "	76·0 "	27·2 "	2							
	Sept.	34·3 "	50·5 "	63·0 "	1·8 "	8							
	Oct.	20·2 "	32·9 "	51·0 "	— 1·0 "	27	2						
	Nov.	—14·7 "	— 6·0 "	22·5 "	—38·0 "	30	23	18	13	7			
	Dec.	—17·4 "	— 6,5 "	11·0 "	—44·5 "	31	28	19	11	7	2		
1897	Jan.	—21·0 "	—11·0 "	10·0 "	— 55·6 "	31	27	21	16	13	9	6	
	Feby.	—12·3 "	0·6 "	31·0 "	—36·0 "	28	23	14	9	2			
	March	—14·7 "			—51·3 "	30	21	15	12	8	5	3	
	April	18·1 "			5·0 "	27	1						

Utilisation of Moss Lands.

By Thomas Macfarlane, F.R.S.C.

Extract.

[*Read March 4th, 1898.*

After a few introductory remarks the lecturer proceeded as follows:—

Utilisation of course includes cultivation, but I do not intend to speak of cultivation only. I shall have something to say about the more modern methods of cultivating moss-lands later on, but the subject is not an inviting one. In these days when almost every one is prepared to tell you that "farming does not pay" he would be a courageous man who would advise a settler to reclaim a swamp.

There is a comparison attributed to Queen Elizabeth which points out that life is like a bog; if you stand still you begin to sink and if you want to keep afloat you must keep moving. I shall, therefore, ask you to leave the consideration of bogs as they occur in nature, and the possibility of cultivating them, and ask you to accompany me, in spirit at least, to see a more pleasing landscape, a moor drained, consolidated and in process of utilization, where art has come in to modify nature, and, as it generally does, to improve it. In describing such a moor I must avoid any minute reference to the plants by whose instrumentality it has been produced. I can only deal with vegetation in a very general way, and indulge the hope that the botanical aspect of the subject may on a future occasion be made the subject of a disquisition by my friend Prof. Macoun, than whom there is no better authority.

The imaginary trip on which I have invited you is to Holland, or, more properly, the Netherlands. Holland is

only one of the provinces of the Netherlands, only one of the Low Countries, although probably the most important of them. It adjoins the German Ocean, whereas the Province that we have to visit, that of the North Brabant, is bounded on the east by Westphalia, and is traversed by the river Meuse, which takes its rise in the Ardennes, flows through Belgium and the Netherlands, passes Rotterdam and reaches the sea at the Hook of Holland. It was by the Hook of Holland route from Harwich that I landed in Rotterdam, on the morning of a foggy Saturday in December, 1892. My business in the Netherlands was to study beer, moss and peat and my first glimpse of the latter article was at the Weimar Hotel where it seemed to be the only fuel in use. After using my letters of introduction diligently, I found that the chief producers of peat and moss litter were the brothers Van Griendt, the elder of whom invited me in the most friendly way to accompany him to his works and extensive moors in the province of North Brabant.

Faithful to my appointment with Mr. Van Griendt, I met him at the railway station in the morning, and was introduced to Mr. C. W. Lancaster, accountant, of Birmingham, England, who visited the moors at the same time. Our route lay across the Meuse and past Dordrecht, Breda, Tilburg and Boxtel to Helmond, where we arrived about 11 o'clock. From here a carriage conveyed us along the Willems Faart, one of the numerous canals of the country, to Asten at the edge of Asten Moor. Strange to say, the Willems Faart Canal lies in lower ground than the Asten moor, but the canals which traverse the latter are connected with it and the general canal system of the country. In order that sloops, or scows may pass from the latter into the canals of the Asten Moor they have to be locked up several feet, which, proves that the Asten Moor is at present a high moor, and must have been higher previous to its having been unwatered and consolidated.

Here it may be profitable to point out the distinction which the Germans have made betwixt two great classes of moor lands, a distinction which might easily I think be carried out in English also. There are first what they call low lying, meadow or greenland moors, to which possibly our word "marsh" would apply. They are always to be found near creeks and rivers, follow the course of these and give rise to the formation of wet and sour meadowlands. The peat or turf which is formed in these is of a black color, and when

dried crumbles easily to dust. It is in these marshes in Canada that the farmer finds his black muck, which is unconsolidated organic matter derived from vegetation of a varied character. On the other hand the heath moss, or high moors show a different character. They are covered by heath plants and instead of a varied vegetation the swamp mosses or sphagnum occur in huge quantity. Dwarf firs show themselves, but sphagnum varieties constitute the main vegetation. Indeed Professor Macoun thinks that the name of peat bog is exactly equivalent to sphagnum bog, and that the "muskegs" of the Northwest have the same mode of origin as the German *Hochmoore*. Of course there are intermediate formations betwixt the "marsh" and the "muskeg" to particularise which would require too much time. Some of these might be characterised as "swamp" and, in these the bushes predominate over the mosses.

Every bog has its origin in a pond, and when the moss vegetation, living and dead, has filled up these and cannot spread beyond the edges it begins to increase and rise in the middle. The German name of "high moor" seems to come from this higher position, which is above the summer water level of the surrounding country. These high moors shew a characterestic arching; being higher in the middle than at the edges, and instances of such moors are known which in the centre are from 15 to 25 feet higher than the level of the water in the basin in which the original deposit began. The vegetable matter which lies beneath the surface ranges in colours from yellow on the top to deep black in depth. These moors yield frequently two different products, moss litter and peat, the former after drying being brown, soft and spongy. The peat on the other hand is when dried, black, hard and unyielding.

Both of these products are found in the Asten Moor, the moss litter lying above the peat, each having a thickness of about four feet. Before the upper layer came to be utilised, and when working a peat bog in the old days, this higher part had to be removed at much expense in order to get at the denser and darker peat which was much more valuable as fuel. Now the upper part brings in more money than the lower, and the manner of working a peat deposit has been revolutionised. The total depth of the Asten Moor down to the soil underneath is about eight feet. This is the thickness after consolidation which is a very different thing from the depth of the bog in its natural state. The shrinkage which it under-goes

on draining is very considerable and amounted in this case to about two feet.

The surface of the consolidated bog is a much pleasanter place now than it ever could have been before. Except for the canals and drains you can walk over it everywhere without inconvenience. Standing in the middle of the Asten Moor the outlook is strange and almost impressive. As far as the eye can reach there is nothing but moor, but the monotony of the scene is very much relieved by the gigantic stacks of moss sods dried and ready for milling.

The Asten moor was not brought into this condition without much labor, carried on after the adoption of a plan thoroughly well thought out, and during the lapse of many years. The unwatering began 20 years ago and had to be done gradually, the first drain being dug only to a depth of about 18 inches. No deeper digging was possible until after the surface part had settled and solidified to such an extent as to prevent the rolling down of the fluid moss into the drain, and the consequent loss of all the labor. After the consolidation of the upper 18 inches, another deeper cut of 12 inches was made in the drain for carrying off the water; then intervened another delay for allowing the bog to settle, and by repeating this process, the gradual consolidation or compression of the ten feet to the eight feet thickness was effected; very slowly and at a rate not exceeding one foot annually. It may be thought that it goes without saying that the solidification of such a semi-liquid mass could have been effected in no other way, but we shall learn, later on, that other methods have been tried elsewhere, with very disastrous results to the parties interested.

One of the most remarkable phenomena to be observed on the Asten moor is the construction in it of canals filled with water, in which scows are floating for conveying the dried sods from various points on the moor to the mill. That such canals can exist without again impregnating the bog with water, and converting the peat and litter into their original semi-fluid state seems astonishing, and yet there are plainly to be seen, within a distance of six feet from each other, the canals in question and ditches by means of which the bog has been unwatered, the latter containing only driblets of water oozing from the bog.

(Here the lecturer gave more minute details of the manner of producing moss litter at Asten.)

Of course there are works for the production of moss lit-

ter and peat elsewhere than in the Netherlands. Sweden, Oldenburg, Hanover and Bavaria are known be producing largely of this material. In England, too, the manufacture is established in the neighborhood of Doncaster and Goole, Yorkshire. In 1896 I visited the moss litter beds near the latter city, and found them thoroughly drained, as in the case of the Dutch moors. There were, however, no canals to be seen for effecting the transport of the material, light railways being substituted for them. I saw the mill at work for teasing and packing the litter, the machinery in which much resembles that employed on the Dutch moors. The material packed had evidently had ample opportunity for becoming dry because the mill building was filled with fine floating dust, like snuff, which however had not the same irritating properties. At the time of my visit the Goole and other works of a similar character in England were suffering from extreme depression in the price of their product. When I visited the Dutch moors four years previously, one of the gentlemen of our party was a Mr. Lancaster from Birmingham, who took as close an interest in the bogs and studied them as thoroughly as I did. This gentleman belonged to a firm of chartered accountants who had been entrusted with an examination of the property from a mercantile point of view, and in order to the possible formation of a limited company for working it. It seems that, subsequently, the formation of the company was accomplished and that its operations brought down the price of moss litter in London from 24s. per ton to nearly one-half that rate. Hence those tears on the part of the Yorkshire people, who could not possibly compete with the Dutch in the matter of labour or freight.

Coming now nearer home, we have to remark, as regards the production of moss litter in Canada, that two attempts have been made, one at Musquash, N.B., and another at Welland, Ontario. In the former case I am extremely sorry to say the capital embarked in the enterprise has not yielded any return. Whether we are to conclude from this that the inherent and climatic difficulties of the undertaking are insurmountable, or that grave errors have been committed in conducting the work is not quite certain. I am, however, inclined to the latter supposition, and venture to point out two circumstances which may have gone a long way to render the venture abortive. In the first place no systematic survey, laying out, and consolidation of the bog was attempted. There was no difficulty in the matter of levels, and a drain

was brought to the edge of the bog and deep enough to unwater it. But any attempt to penetrate the bog at such a depth was futile. Its semi-liquid mass rolled into the drain quicker than it could be dug out, and made progress impossible.

In the second place it was thought possible at Musquash to get rid of the water more rapidly than by the slow steady-going operations of nature. Much ingenuity was displayed and much expense incurred in inventing and operating machinery for squeezing out the water from the mossy pulp but without success. Artificial heat was also used for effecting the drying more rapidly, but it is hard to conceive how that could have been done economically. Drying by natural means was supposed to be impossible. Indeed a sod of moss, dug direct from the unconsolidated bog, and exposed to the direct rays of the sun for a long time is still found to be extremely moist in the inside. Therefore it is that, previous to any attempt at drying such sods, their material must be previously drawn together; consolidated by pressure while in the original bed, so that when they come to be acted upon by wind and sun they will be better conductors of heat, and dry in a reasonable space of time. On the whole the failure at Musquash may possibly have been owing to the common fault of neglecting or undervaluing the experience which has been gained elsewhere.

In the County of Welland, bounded by the Welland Canal, its feeder, and the shores of Lake Erie, there is a large area of "marsh," the history of which occupies considerable space in the records of the County Council. The Ontario Peat Fuel Company is now engaged in trying to utilize the material of this marsh for making moss litter. The product has been placed on the markets of our Canadian cities and is to be purchased in Ottawa. We most sincerely trust that everything will be done by Canadians to make use of it, not only on account of its inherent good qualities, but on account of the advantage which is likely to inure to our agriculture by its extensive application to the various purposes for which it is suitable.

If ever the moss litter industry succeeds in Canada it will most likely to do so in the Province of New Brunswick, which is said to contain the most extensive moors in the Dominion. Many of these skirt the shores of the Gulf of St. Lawrence, and those near Point Escuminac have been described by the late Mr. Edward Jack of Fredericton. In his lifetime Mr. Jack was an enthusiast in exploring the moors

of his native province, and advocating their exploitation. Let us hope that his mantle will fall on a worthy successor, and that the working of these huge deposits of organic matter may at last be carried out successfully.

In the Province of Quebec, although the production of moss litter has not actually been accomplished there is abundance of the raw material as our Chairman very well knows. Anyone who has travelled through the province must have observed their occurrence at Valleyfield, Berthier, Three Rivers, Champlain, Levis, and at numerous points on the line of the Intercolonial Railway. Between Cacouna and St. Arsene there is an excellent example of a high moor, well situated for exploitation. I am not aware as to whether any statistics exist as regards the quantity of such land in Quebec, but the figures are obtainable for Ontario. In the Report of the Bureau for Industries for 1896 it is stated that there are in the province :—

Acres cleared.....	12,671,857
Acres woodland.....	7,264,167
Acres swamp or marsh.....	3,236,390
Total occupied.....	23,172,408

Thus of the rural area or total number of acres of assessed land 25.5% or over one-fourth is bog or marsh, containing an as yet unappreciated store of fertilizing material. It so happens that the first succesful attempt to utilize Moss Litter for sanitary purposes in Canada was made in the Province of Ontario. At Caledonia Springs the method of deodorising human refuse by means of the moss from a bog in the neighborhood has been carried on for several years with the most satisfactory results to all concerned. The moss litter here referred to is unusually rich in nitrogen, assaying nearly 3%, and the compost resulting from its use is an excellent fertilizer.

I have now told you something about the production of Moss Litter, and must next anticipate the question—Well, what is the good of it all? What is done with the article and of what advantage is it to the human race in general, and to agriculture in particular? In answering such enquiries I must leave peat and its applications out of consideration, not because they are unworthy of attention, but because of the want of time on the present occasion. Furthermore, Moss Litter has about four times the value of peat, and the successful working of the former, which as a rule lies above the peat,

must precede the production of fuel from the lower beds of the sphagnum bogs. I very much fear that the want of success which has so far attended the working of peat bogs for fuel has been owing to the fact that the true nature of the upper parts of the "white turf" or "bastard peat" or moss litter as we call it was not taken into consideration. I am convinced that the way to success lies first in the utilization of the moss litter for sanitary and agricultural purposes. Even in speaking of that article I must, for want of time, restrict my remarks to two of its applications, both of which tend to the enrichment of arable land.

1. It is used in town and country all over Europe for bedding animals, and keeping the stables clean and inodorous. It is thus a substitute for straw than which it possesses better absorbent qualities. Its price is seldom higher than that of straw with which it competes vigorously. Here in Ottawa it sells at about double the price and consequently the trade in it is not very brisk.

2. It is used as an absorbent, deodoriser and disinfectant for all manner of domestic refuse, including human excreta and kitchen offal. It has also been found convenient to apply it in slaughter houses and factories, whose products are of an evil smelling sort. Anyone can easily convince himself of its deodorising qualities by mixing a little of it with kitchen refuse in summer time, by which means the latter is kept inoffensive until removed. Not only does moss litter, on account of its porous, spongy character, take up obnoxious gases, but it can also absorb from 10 to 16 times its weight of water. Drying by means of it, applied to organic substances, is one of the best plans for arresting their decomposition. (The lecturer next described the nature and constituents of moss litter the production of humus from it and the advantages of the latter in agriculture.)

It will scarcely answer in these days of steam and electricity to say that "there is nothing new under the sun," but so far as regards agriculture, the oldest of the arts, I believe that modern investigation reveals very little not previously known. Take the acquisition of the nitrogen of the atmosphere by the leguminosae, a fact now universally accepted by agriculturists, that seems to have been known to the ancients and a passage in Pliny shows that the Romans based their practice on it. Neither is there anything entirely new in the application of moss litter as an absorbent and deodordiser. When Professor Macoun was collecting his specimens of sphagnum

varieties in the Northwest, an Indian Chief asked him if he proposed to take them to his squaw. It seems that the Indian women collect and dry the sphagnum moss, and encase their babies in it, and that it keeps them perfectly dry and comfortable during the long journeys which they have often to undertake when they are swathed up in Indian fashion and carried on the backs of their mothers. Dr. Dawson also tells me that along the trails in the same region tufts of moss are to be seen stuck on poles, and exposed to rain, sun and wind. It is in this way that the moss is prepared and stored for the sanitary requirements of the Indian babies when travelling. That which has been the practice of Indian tribes for centuries is now being introduced in many German cities not only as the best system from a health point of view, but as the one likely to bestow great advantages on agriculture. The committee on manures of the German Agricultural Society is now devoting much attention to this subject, and any one, who wishes to know the progress they have made and the valuable results they have arrived at, should study the valuable book by Dr. J. H. Vogel, published in 1896, on the disposal of City Refuse.

It would indeed be a fool-hardy and Quixotic undertaking for anyone in the present day to begin a crusade against the water-borne system of sewage removal. The love of ease and modern conveniences, and the indisposition to look the problem of city sanitation squarely in the face are too strong to afford such a reformer any chance of success. But in localities where no such system has been established and in towns where local circumstances make it impossible, it would, in my opinion, be advantageous for the authorities to consider seriously the moss litter system of dealing with human excreta. Even in cities or their suburbs, where there are districts almost destitute of any system and where the removal of refuse is a source of constant annoyance, the use of moss litter might prove to be an unhoped-for blessing. The manure resulting from its use is entirely deprived of any offensive character, and would be of the greatest advantage to the farmers of the neighborhood.

(The lecturer concluded by referring to the various methods employed for reclaiming and cultivating moorlands in place, and gave particulars concerning the Rimpau dam system at Cunrau on the Elbe, and the Corporation farm on Carrington Moss near Manchester.)

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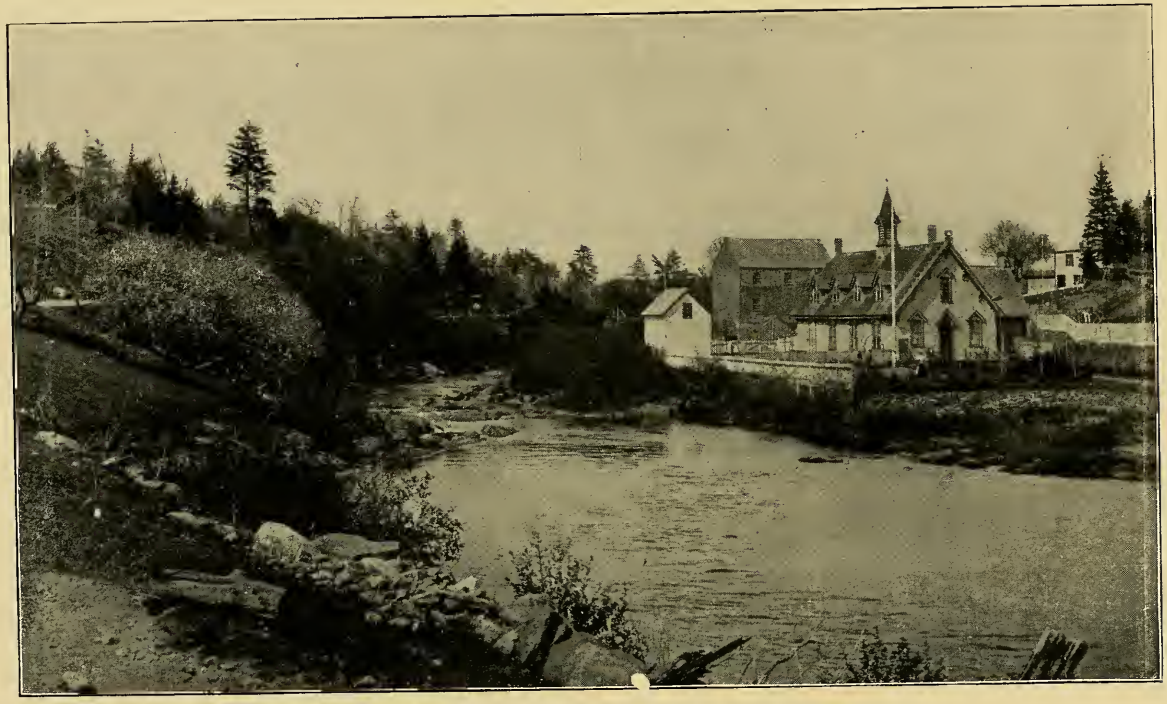

Dominion Government Salmon Hatchery, Bedford Basin, Halifax, N.S.

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TRANSACTIONS

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INTRODUCTION.

When the first number of the Transactions of the Ottawa Literary and Scientific Society was published, the series of papers which it contained was prefaced by a concise and very appropriate introduction by my predecessor in the Presidental Chair, Mr. Otto Klotz, who so clearly stated the *raison d'etre* of this publication that any words of formal introduction to the present pages might well appear superfluous.

The days of lengthy introductions, of formal preludes and prologues are, indeed, over as Dr. John Skelton has warned us in his delightful "Table-Talk of Shirley." The genial Edinburgh *litterateur* did not shrink, however, from expressing a word of commendation for the well-nigh obsolete formality. ———'As youth', he said 'is glorified by the pleasure of anticipation, so the prologue to poem or romance, nay, even the prospectus of a limited company, has something of the same attractive uncertainty."

Without attempting a repetition of the purpose and aims of this publication, already outlined in the introduction by Mr. Klotz referred to, it is enough to point out that the papers in the present number range over a varied field, literary and scientific. The contributions are original, and were prepared for, and read before, the Society. They represent not so much the popular and entertaining side of the Society's work, as that more technical and substantial side, to which special importance has always been attached by those who have had the administration of the Society's affairs at various stages of its history.

It is a worthy ambition for any society, not merely to take a leading part in the educational work of the capital, to foster and encourage among the citizens a taste for intelectual pursuits, but to endeavour to add year by year to the sum total of human knowledge. A means of publication, such as is afforded by these Transactions may, indeed, prove an incentive to original investigation by members of the Society. To many it has been a matter of surprise that so much new and original matter, as evidenced in the former and in the present number of the Transactions, is available in the form of written contributions by members of the Society and others. To some, perhaps, this fabric of original work in literature, science, art, and other fields, may not appear very ambitious or imposing. Abraham Cowley cherished the desire to build a house—only a small fabric in a large domain, but it was to be an original structure, his own building. This may be claimed for the contents of the present publication that they embody matter specially prepared for the Society, and in most cases wholly new and hitherto unpublished; but it must not be forgotten how wide is the field for original research, how vast the domain that invites exploration. The publication of these Transactions will be amply justified if they embody contributions, of an original and substantial character, in the extensive field of Canadian literature and science.

As an indication of the scope and character of the Society's work, the programme of lectures, papers, &c., arranged for the Sessions 1898–99 and 1899–1900, are printed below.

1898—1899

Dec. 9.—Literary Evening.

1. Introductory Address by the President.
2. Literary Essay by J. Francis Waters, M. A., Subject : "Demosthenes on the Crown."
3. Poetical Readings by W. Wilfred Campbell, F. R. S. C.
4. Literary Essay by W. D. LeSueur, B. A., Subject : "The Masters of English Prose."

Dec. 16.—A. McGill, B. A., "A Study of Browning's Paracelsus."

Jan. 6.—Professor E. E. Prince,
"Four Latter Day Poets."

Jan. 20.—R. W. Shannon, Esq.,
"Wordsworth."

Feb. 3.—Alfred A. Dion, Esq.,
"Electricity with Demonstrations."

Feb. 10.—Rev. A. B. Walkley,
"The Poets of our Land."

Mar. 3.—John Henry Brown, Esq.,
"Walt Whitman—Poet and Seer."

Mar. 10.—Professor James Mavor,
"Imperialism versus Civism."

1899—1900

Nov. 17.—Prof. E. E. Prince,
"The Scottish Schubert—Dr. John Park."
With vocal and instrumental illustrations.

Nov. 24.—J. M. Macoun, Esq.,
"The Canadian Wood-Pulp Industry."

Dec. 1.—Rev. Dr. Rose,
"The Gulf Stream of Literature."

Dec. 8.—F. H. Gisborne, Esq.,
"Dean Swift and his work for Ireland."

Dec. 15.—S. B. Sinclair, Esq.,
"The Golden Mean of Wealth."

Jan. 12.—George Johnson, Esq.,
"Our Northern Fringe."

Jan. 19.—"Is our Age really progressing?" A symposium to be opened by Rev. A. B. Walkley.

Jan. 26.—Leon Gérin, Esq.,
"The Hurons of Lorette."

Feb. 9.—W. D. LeSueur, Esq.,
"The Making of Language."

Feb. 23.—"The Limitation of Municipal Industries." A Symposium to be opened by Members of the Social Science Club.

Mar. 9.—R. F. Stupart, Esq.,
"Earthquakes and the Seismograph."
With Lantern Slides.

Mar. 23.—A. McGill, Esq.,
"Ground Water Wells."
With local illustrations

Otto J. Klotz, Esq.,
"Local deflections of the Plumb-line."

Prof. E. E. Prince,
"Fish Culture in Canada."

E. E. PRINCE,
President.

CANADA'S NORTHERN FRINGE.

By George Johnson, F. S. S. (Hon.)

I

We have in Canada, a region of unknown area, Surveyor-General Deville having made no attempt to ascertain the number of square miles of land surface it contains.

It is an out-of-the-way region. We scarcely think of it when we use the word "Canada." It is not mentioned in Parliament once a session. It suggests no scandals, no award of contracts, without or with tender. Mr. Tarte's dredges are not in demand there. Mr. Blair's engineers are not in request for either canals or railways. Sir Louis Davies is not called upon to provide light-houses and automatic fog-horns, nor is Mr. Fisher solicited to supply hot or cold storage for the products of its orchards and its dairies. Sir Charles Tupper and Mr. Foster and Mr. Fielding are not needed to keep watch and ward over the Treasury-chest to guard against cunningly devised assaults upon the people's money by the people of this region. Mr. Borden had not to decide in October and December last how many volunteers to apportion to it as its share of the gallant 2000 who went, our pledge of Empire, at the call of the Empire, more than 7,000 miles over oceans dreary waste to represent us on the blood-stained field of South Africa. Yet this region has been the scene of great activities. It has been a favorite camping ground for scientists. It has had its free theatres, its free newspapers, its free schools, its own currency. For good work done within its borders it has given more C. B's and K. C. B's and G. C. B's to Britain's sons than any other Province of Canada. It has been a hot-house for growing Rear Admirals, Vice Admirals, Admirals and Admirals of the fleet. It is Canada's Westminster Abbey—one of the grandest temples on earth—"a temple not made with hands"—with more commemorative tablets than has the great temple of silence and reconciliation on the banks of the Thames with its accumulated monuments of over 700 years.

What the Holy Land was to Europe in the time of the Crusades—a field for the adventurous, a training school for the soldiers of Christianity—that this corner of Canada has been to the Mother-land. Among it's thousand isles and straits, the seamen of the United Kingdom have received training to develop caution, dash, intrepidity, individuality, coolness in time of danger, determination undismayed by defeat and all those masterful qualities which are the hall-mark of the British national character.

The greater portion of this region is included in that part of Canada where the lines of longitude converge so that a degree of latitude is from 21 to 10 miles in length instead of the 60 miles on the equator or the 44 miles on the latitude of Toronto.

This region is a region of islands. They have been won for

"The flag that has braved a thousand years
The battle and the breeze,"

by a series of sea-fights with storm and tempest, ice-bergs, and ice-floes, carried on during many years under most unusual and trying conditions, by seamen, "the bravest of the brave."

Canada is essentially a hero-land. There was much of the stuff of which heroes are made in the men who sailed up the St. Lawrence River and won the region of its Great Lakes for the coming generations during the period in our history when the policies of concentration and of expansion first strove with each other, like Jacob and Esau in their mother's womb—the first to confine population to the lower St. Lawrence, and the other to spread over the interior the posts of war and of trade*. The story of the struggles of French and English with the savages of the forest is diamond-pointed all over with deeds of heroism. The long-drawn-out contest of the French with the Five Nations—those Boers of the past centuries ; the march of Frontenac into their country ; the momentous fight of Dollard and his 16 consecrated companions with the Iroquois ; the repulse of Pontiac by Gladwyn when that great warrior, chief of the Ottawas, besieged Detroit ; the fiery career of Sieur d'Iberville,—these and scores of

*See Parkman's "Half Century of Conflict."

others like them all attest that when French were fighting Indians and when they were fighting English, when English were fighting French and Indians, there were among English, French and Indians, heroes in plenty. "Troops of heroes undistinguished died" in the winning of Canada for civilization. We are only now beginning to appreciate at their true worth the pioneers of Canada. The United Empire Loyalists who passed the early years of their life in Canada encompassed with trials, cheerfully borne and successfully overcome, that would have daunted all but men and women cast in heroic mould ; the pioneers who entered each of the 45 counties into which Ontario is divided and by painful processes hewed out the farms from the forest and lived noble lives in lonely log huts scantily furnished—of these it has been said and truly "no better stuff stood beside Nelson on board the 'Victory', no better stuff climbed the heights of Alma or charged the Dervishes at Khartoum" and we may add 'or plunged into the pitiless storm of shot and shell on their resistless way up the precipitous sides of Elandslaagte, or swept their brave foes away along the banks of the Modder River."

The islands of our north have had their heroes, too, and the seamen who won them for the Empire and for Canada are the peers of those who toiled and were martyred along our southern borders.

The general name by which these islands are known is "District of Franklin."

They are appropriately so named in honor of Sir John Franklin, whose exploits in circum-polar regions and whose tragic fate are fittingly commemorated by a monument in Westminster Abbey, by a marble slab prepared under the direction of Lady Franklin and erected in 1851 by Captain McClintoch on Beechy Island ; and by Sir John Macdonald's selection of the great explorer's surname as the official and distinctive appellation of our Arctic Archipelago.

HOW DID IT BECOME OURS TO GUARD AND KEEP FOR THE EMPIRE?

It was transferred to Canada when the North West Territorities were handed over to our care to develop and make the great wheat-raising country it is destined to become, thus solving

the problem ever pressing upon the heart of the British Empire, viz.: How can we supply our food-wants within the Empire itself? Doubts having been expressed by Hon. David Mills in 1878* about the inclusion of the Islands of the Arctic Archipelago in the transfer on the 23rd June 1870, a second Order-in-Council, at the instance of the Parliament of Canada, was passed by the Imperial Privy Council, dated 31st July 1880, by which instrument all the islands were made over to Canada from 1st Sept. 1880† ; thus making assurance doubly sure.

The district of Franklin was constituted and the name conferred by an Order-in-Council of the Canadian government in October, 1895. A subsequent Order-in-Council modifying the allotment of territory was passed in December, 1897, two peninsulas connected with the mainland being added.

WHAT DOES FRANKLIN INCLUDE? WHAT ARE ITS METES AND BOUNDS?

Leaving Hudson Bay out there is the great sea called Baffin's Bay with its northern connections, to the Paleocrystic‡ Sea, of Smith's Sound, Kennedy and Robeson Channels, and its western openings of Jones Sound and Lancaster Sound. Parallel with Baffin's Bay is Fox Channel, connecting by the Fury and Hecla Straits with the Gulf of Boothia, also parallel to Baffin's Bay. The Gulf of Boothia connects by Prince Regent Sound with Barrow Strait which is a continuation of Lancaster Sound running east and west. The western development of Barrow Strait is the expansion called Melville Sound with lateral openings north and south. The northern side openings are Wellington channel, Queen's channel and Penny Strait, these three being prolongations of each other ; and Byam Martin Channel ; on the south side the openings are Peel Sound, Franklin Strait, McClintock

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*Hansard, May 3rd, 1878.

†See Statutes of Canada 1880-81, Impl. Despatches of Orders-in-Council, page IX.

‡Paleocrystic, consisting of ice that does not melt in summer but exists from year to year. First applied to the northermost ice floes encountered by Capt. Markham's party in 1875-6.

Channel, Victoria Straits, Prince of Wales Strait. The Northwesterly extension of Melville Sound is McClure Strait, connecting the Sound with Beaufort Sea and connected with the Paleocrystic Sea of the north by Kellett Strait, Crozier Channel and Fitz William Strait. The Beaufort Sea is connected with Boothia Peninsula along the continental north line of coast by Dolphin and Union Strait, leading into Duke of York's Archipelago and Coronation Gulf ; by Dease Strait from Coronation Gulf to Victoria Gulf ; by Simpson Strait leading to Rae Gulf and the juncture of Boothia Peninsula with the rest of the continent.

The general appearance is that of a fish's back bone, comprising Lancaster, and Barrow Straits, Melville Sound and McClure's Straits with lateral straits on either side. It is like Bank Street with Sparks, Queen, Albert and Slater and other cross streets. It suggests a greater Venice with ice or water streets in every direction but principally north and south. It is a miniature British Empire with the straits for streets just as the British Empire has the seas for streets.

On the far northeastern side of this mighty archipelago and on the western side of Smith, Kennedy and Robeson Channels are Grant Land (bordering on Lincoln Sea), Grinnell Land immediately south of Grant, Arthur Land, Schley Land, Ellesmere Land and N. Lincoln.

Crossing Jones Channel we see North Devon, Victoria Archipelago, Cornwallis Island, North Cornwall, Bathurst Land, Melville Island and Prince Patrick Land lying north of the great central west and east street of the hyperborean Venice ; on the south side beginning at the west there are first, the great island of Banks Land ; then the still greater island named at the north Prince Albert Land, on the west Wollaston Land and at the south Victoria Land ; then across McClintock Channel, Prince of Wales Land ; North Somerset, Prince Regent Island, Cockburn Island, Possession Land and Baffin Land with its appurtenant divisions, Fox Land, Meta Incognita and Cumberland, and its islands, Salisbury, Charles, Mill and Nottingham.

We have completed the round and have only to mention (1) Melville Peninsula to which Capt. W. E. Parry refers as "the huge peninsula situated like a bastion at the north east angle of Amer-

ica," which he named Melville Peninsula in honor of Viscount Melville, then first Lord Commissioner of the Admiralty. Separated from Melville Peninsula by the Gulf of Boothia and stretching far into the north is the last of the great lands of the District of Franklin. It is (2) the Peninsula of Boothia, jutting up north among the islands to the 73rd degree and forming the most northerly part of the mainland of this continent.

The flag was displayed and possession taken of the different parts of the Arctic Archipelago at different times and by different men.

Frobisher and Davis took possession of the islands on the north side of Hudson Strait. Baffin took possession of Elesmere Land and all the tract of land stretching far to the north and ending with Grant Land.

Parry took possession of the northern islands along Barrow and McClure Straits. Belcher took possession of North Cornwall, McClure of Prince Albert Land ; James Ross of Boothia ; Parry of Melville Peninsula. Some of the islands were taken possession of by several persons, one navigator raising the flag at the west, for instance, another at the north, and a third at the south, further explorations showing that the land thus secured belonged to the same island.

Possession was assured in different ways. Frobisher took possession of the south eastern land of the District of Franklin in 1578, more than three centuries ago, by ascending a high hill which he called Hutton's Headland, after one of Queen Elizabeth's favorites and there erecting a large cross of stone in token of christian possession.

The ceremony of taking possession as performed at a latter date is thus described by Dr. Armstrong, the occasion being the taking possession of Baring Land by the Captain of the "Investigator" :

"Having advanced slowly during the night, at 8 a. m. we had reached within two miles of the magnificent headland (which they named Lord Nelson Head, in honor of England's famous sailor) and could obtain no soundings in 120 fathoms of water. Preparations were at once made for landing and taking formal

possession of it in Her Majesty's name. Accordingly Capt. McClure and myself left the ship in the third whaleboat followed by Lieut. Cresswell and as many officers as could be spared in the first cutter. The morning was cold but with a fine clear atmosphere and a fresh breeze from the north-east and with joyful hearts we pulled towards the shore. As we approached we found the ice still packed on the shore so that we were obliged to get out and haul the boat over the floes into clear water which led us on to a fine pebbly beach eastward of the cape, extending out for some distance and it could be distinctly seen to be of great depth from its perfect transparency."

"On landing we unfurled a red ensign and planting the flagstaff in the soil took formal possession in the name of our most gracious Sovereign with three hearty cheers and one cheer more, bestowing on our discovery the name of Baring after the first Lord of the Admiralty under whose auspices the expedition had been fitted out. A scroll containing the ship's name and those of the officers, &c., was placed in a bottle and carefully secured in a cask fixed in the soil, with a pole fifteen feet high attached, to attract the attention of any subsequent visitors to Baring Land. The appearance this bold headland presented while we approached the shore in the boat and when viewed in profile was exceedingly fine. Indeed I may state that its sublimity and grandeur were only equalled by its picturesque beauty, producing an effect I have seldom seen surpassed and recalling forcibly to mind, but on a scale of greater magnitude, the finest of our old gothic structures and castellated mansions according as its position varied with our progress." The headland thus described was 850 or 900 feet high and gives an idea of the character of the scenery of the land to which tourists of the future may go to spend their holidays.

HOW DID OUR ARCTIC PROVINCE BECOME GREAT BRITAIN'S SO THAT THE SUZERAIN HAD POWER TO TRANSFER IT TO CANADA ?

Boyd Thacher says "When we study the first westward sailings of hardy English navigators we are only reading the title deeds of our beloved country."

This is true of all North America. It is emphatically true of Canada, and most emphatically true of the Northern fringe of this portion of the British Empire committed to our care by solemn instrument bearing the signature of our beloved Queen.

In order to answer the question asked let us study for a while the "sailings of the hardy navigators."

From a very early date circum-polar regions exercised a peculiar fascination over the men of the European races. From Pytheas to the Duke of the Abruzzi ; from 323 years before "bright-harnessed angels sat in order serviceable" around the Babe of Bethlehem to this year of grace 1900 more than 170* sea-voyages and land journeyings and one balloon trip in high latitudes have been undertaken by different nations, by navigators sailing now in a westerly, now in an easterly course, or by explorers pressing northward over land, now gliding smoothly down the liquid highways of the wilderness, now running rapids and portaging cataracts, either in search of new whaling grounds and of polar water communication, or for the purpose of wresting from the frozen north its ice-imprisoned secrets of climate, of mineral wealth and ocean life.

Danish, Dutch, Spanish ; Italian, Greek, Swedish ; English, Scotch, & Irish ; French, Icelandic, Norwegian, Portuguese, Russian, Venetian ; Canadian and Unistoniam† explorers by sea and by land, during more than 20 centuries have taken part in these attempts to make the Lady of the Iceberg throne and the snow diadem their obedient vassal.

In lordly ships, strengthened and braced by every mechanical contrivance ; in barks of small tonnage, in pinnaces that were the veriest cockle-shells ; in canoe and kayak ; in clinch and shallop, and bomb and pink ; by dog-train and by that most ancient of all methods of transportation, "shank's nag" frequently called the "marrow bone stage" ; with store-room sometimes provided for years of sharp onslaught, sometimes empty as the cupboard of that far-famed woman "old Mother Hubbard" when she visited it with benevolent intentions for her dog—hardy and adventurous seamen and persistent landsmen have attacked circum-polar seas from every quarter, intent upon winning renown for themselves and profit for their nation.

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*Mr. Chas. C. Smith, in a paper contained in Justin Winson's Narrative and Critical History of America, states that since Frobisher's time more than 100 sea voyages and land journeys have been undertaken in quest of the North West Passage. To this number must be added those in search of a North East Passage.

†Formed from the words "United States of North America" to avoid the use of that verberian misfit "American" so often used to designate the people of one country of the seventeen or eighteen countries of this Western Hemisphere.

A thousand place-names bestowed on headland and cape and promotory, on gulf and strait and channel and bay, on river and lake, on islands great and islands small—some of them hoary with age before Poutrincourt sailed into and named Port Royal, or Champlain dug the first cellar in Quebec, some of them but of yesterday,—testify to the unresting diligence with which the men of the past and of the present have sought fame and fortune in the Frozen Sea which tumbles round the occult precincts of the elusive North Pole.

Taken as a whole these place-names have been baptised in the death-throes of full 2,000 men who have lost their lives from starvation, from cold, from disease, from wild beasts, from drowning and from murder most foul. On an average one human life has been sacrificed for each place-name given, possibly two for each.

From the seventeen score of persons drowned on the voyage from Iceland to Greenland in 983-4 to the criminal taking off of Henry Hudson, his son and his seven faithful friends, by the mutinous crew of the "Discoverie" in the wild waters of the west coast of our District of Ungava ; from the fifty who perished on Marble Island, dying one by one till the last man fell dead as he tried to dig a grave for his comrade, to the ghastly find of 30 skeletons of men in an inlet appropriately named Starvation Cove by the horrified discoverers, and that other find by Eskimos in Terror Bay of a tent, the floor of which was completely covered with the bones of white men; from the destruction of the remainder of Franklin's men as with hunger-shrunk bodies they toiled homeward from Montreal island in the estuary of the Great Fish River, just under the Arctic Circle, down to the present time, precious human lives have been dropping, one by one, score by score, into the abyssal depths of northern seas.

Thousands of women have, like the psalmist, "eaten ashes for bread and mingled their drink with weeping" because of the loss of husband and son and lover in voyages and expeditions of which these place-names are the memorial tablets, nor were their burdens lightened by any Rudyard Kipling of the times with his song of "The Absent Minded Beggar" of more value than many "cloths of gold," as a "pot boiler."*

*The newspapers announce that the "Absent Minded Beggar" produced for the war fund the sum of $485,000.

Well and truly has Peter Sutherland, writing in 1850, said, "There is hardly an island on which one lands from the Arctic Circle to the top of Baffin Bay but it will be found in a manner consecrated by the remains of some British seamen over which the burial service has been read and a green mound has been raised and marked by a monument of which St. George's Cross is the most common form. Our friends buried within the Arctic Circle lie forgotten by all except perhaps their relatives, and unvisited save by the eider-duck which makes her nest among and on their graves." Since the worthy surgeon wrote this statement, yea, even while he was writing it, the circle of graves in the Arctic islands was much more widely extended. Through Barrow Straits and Melville Sound and McClure Straits, on the islands on both sides, there are graves of British seamen. Of the "Investigator's" crew five men died and Beechy Island and Cape Cockburn and Bay of Mercy, (Banks Land), hold their remains, while King William Land and other points hold 9 officers and 15 seamen of Franklin's fated expedition, of the other 118 men of Franklin's party who perished it may be said that their graves are scattered far and wide within the Arctic Circle.

II.

The Greeks were early in the field as northern navigators for 320 or 323 years before Christ was born into this world, Pytheas, a Greek sailor, contemporary with Alexander the Great, having learned the art of navigation in that early training school of seamen, the Mediterranean Sea, left Cadiz, (the oldest great city of Europe, name coming from *Gades*, meaning the "walled place"), then the chief Phoenician emporium, and cautiously felt his way along the coasts of Spain and Gaul and explored the shores of Great Britain. Among other things geographical he mentions as about six days' voyage from Great Britain, an island he calls Thule,* a place-name embedded in the history of place-names, as a fly in amber, by Virgil in the form of "Ultima Thule"; "the farthest off land" of the navigator of more than two thousand two hundred years ago thus coming down to us, "the heirs of the ages," as a frequently used expression to denote some far away goal difficult to reach.

*From the Gothic word *Tiule* meaning "the most distant land." We have several near relations of this word in common use, as, for instance, Telescope, Telegram, Telephone.

The poet Thomson in "Autumn" refers to Pytheas's isle when he says :

"Where the northern ocean in vast whirls
Boils round the naked melancholy isles
of furthest Thule."

The Irish, the Norwegians, the Swedes and the Danes were in the exploring business at an early date. Decuil in his book "de Mensura Orbis Terrarum," writing in 825 says "it is now 30 years since I was told by some Irish ecclesiastics who had dwelt in that island (viz. Iceland) from the 1st Feby. to the 1st of August that the sun scarcely set there in summer and that it always leaves light enough to do one's business."

Naddodd, a Scandinavian pirate in 860 appropriately named the island Sneeland (Snowland). The island was subsequently visited by two Swedes Svofason and Flokko by whom the name was changed to Iceland which it has ever since retained. In 847 the Norwegians Ingolf and Lief were such lovers of freedom that they led a body of retainers there ;

Where cheered by song and story dwelt they free
And held unscathed their laws and liberty.

Between 878 and 901 our own King Alfred justly singled out in England's emblazoned historic page as the "Great" (the only one of our 48 sovereigns so designated) was trying to make his little Wessex a model land so that he "might"—to recall his dying words—"leave to the men that came after a remembrance of him in good works." We all know what he accomplished and all realize in the words of Greene that "the memory of the life and doings of the noblest of English rulers has come down to us living and distinct through the mist of legends and exaggerations that gathered round it."

We can heartily endorse Sir Walter Besant's view of him : "There appears one who restores the better spirits of the people by his example, by his preaching, by his self sacrifice. There passes in imagination before us a splendid procession of men and women who have thus restored a nation or raised its fallen ideals, but the greatest of them all, the most noble, the most godlike is that of the 9th century Alfred. There is none like Alfred in the

whole page of history, none with a record altogether so blameless, none so wise, none so human."

Goldwin Smith in his latest historical work "The United Kingdom, a Political History," marvellous as a brilliant specimen of "picekd and packed words" says :

"Made ubiquitous by his command of the sea which the English had now resigned, pouncing where he was least expected, sweeping the country before the national levies could be got together and at last keeping permanent hold upon large districts, the Dane had brought the English kingdom to the verge of destruction when a heroic deliverer arose in the person of Alfred, the model man of the English race. Round the head of Alfred a halo has gathered ; his history is panegyric ; yet there can be no doubt of his greatness as a saviour of his nation in war, as a reorganizer of its institutions of which pious fable has made him the founder, as a restorer of its learning and civilization.

In the development of his wide-reaching aims, he became the founder of the science of geography in England and sent out Othere, a Norwegian sea captain, on a voyage of exploration in the course of which he discovered, about 890 A. D., the White Sea, so named because of its proximity to sterile regions white with driven snow and dazzling ice.*

Thus early did England become associated with circum-polar seas.

About 876 an Icelandic wanderer, Gunnbjorn† by name, blown out of his course by a blizzard like those which worry the life out of the people of Nebraska, Dakota and Minnesota, was compelled to pass the winter ice-blocked in an inlet of an unknown land. He and his crew, released by the welcome forces of summer, returned to tell to wondering friends the tale of their residence in the "thrilling regions of thick-ribbed ice."

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*C. King Alfred's account of the voyages of Othere and Wulfstan in his adaption of the universal history of Orosius. The King's account is given as he heard the voyages recounted by the adventurers themselves.

†We have on our charts in a very mutilated form a place-name commemorative of Gunnbjorn in Gomberg Scheer (Gunnbjorn's Skerry) nowadays a dangerous reef away up north—in his time a true skerry before a seismic disturbance blew it into flinders. (See Kipling's "Lights of England" for "Skerry.")

Eric Raude, (Red Eric), an Icelander, had heard by the firesides of his father and neighbours the story of Gunnbjorn's adventures and when he was convicted of manslaughter before the *Thornaes Ting* or Judicial assembly, of Iceland and sentenced to banishment for a term of years he bethought him of the story and resolved to pass the time of his sentence in exploring the unknown land. He doubled the cape, called by Gunnbjorn Hardsaerk (known to modern whalers as Cape Farewell) and 110 years after Gunnbjorn's unwilling voyage gave the land the curious name of Greenland, or its equivalent in his native tongue. When Eric, the red-headed son of a viking, called the country Greenland he was not afflicted with colour-blindness, nor did he see it through green spectacles, nor was he in a sarcastic mood as sailors are wont to be when disappointed.

He so named the fiord into which he had penetrated, because the land around it was clad in living green, the season being the prime of summer time and the grass wearing its liveliest emerald suit. Purchas in "his Pilgrimage" says "Greenland is a place in nature nothing like unto the name; for certainly there is no place in the world yet known and discovered that is less green than it."

Sir John Ross says of an island off the Greenland Coast still farther north than Eric's fiord: "The island was a far finer object than our former experience of it at an earlier, and perhaps in a worse, season, had given us reason to expect on this icy coast and reminded us in a lively manner of the far fairer land (England) which we had quitted but a month before and of the summer which we believed we had left behind. Every practicable part of the surface, even the smallest spot which was not a pure precipice or a sea rock, was covered with verdure, while a profusion of wild plants, now in full and luxuriant blossom, rendered that a summer garden, which we expected to find (what we had often done before) a chaos of rugged rocks and cold snow. We therefore no longer wondered at those who had given the name of Greenland to a country which others, as well as ourselves, had long thought to have been ridiculed by such a denomination. It was in truth a *Greenland.*"

You see it is the old story of the dispute about the color of the chamelion and about the gold and silver shield.

I may remark here that it is quite a common happening for a place-name originally applied to a small section of country to be given, in process of time, a wider range so as to become the distinguishing geographical term for a much larger area, and this happened in the case of Greenland, the whole peninsula receiving its name from Eric's fiord. Our own place-name "Canada" is "an example to the purpose quite." It was originally, according to Jacques Cartier, the name an Indian tribe gave to their movable, easily transplanted collection of wigwams. It became in time the name of two great Provinces. It is the designation of a country extending west and east from Cabot and Belleisle Straits to Mount St. Elias and Queen Charlotte Islands, and north and south from Pelee Island to Grinnell Land, with an area nearly one third of the whole area of the British Empire, not including the Transvaal and the Trans-Orange Provinces. No doubt the humor of it has kept the original Norse name of Greenland from displacement.

Eric was so pleased with his Greenland that he returned to Iceland and gathering together a number of his fellow-islanders, set out for his emerald fiord with a fleet of 25 vessels, like the one Froude has described from a specimen "which he saw and saw again" at Christiania, exhumed from its peaty grave where it had rested nigh unto a thousand years. But ruthless ice-bergs and angry winds destroyed and greedy waves swallowed up eleven of Eric's vessels with their human cargoes of 300 or 400 souls—the first recorded body of emigrants to come to North American shores—the first great loss of life on our coasts which have since witnessed so many terrible wrecks.

The other vessels succeeded in reaching the desired haven with 400 or 450 persons who began housekeeping on the west coast just north of the island we know as Cape Farewell. In course of time these first settlers and others who joined them branched out to the next fiord and then to the next and then began another settlement 400 miles further north in just about the same latitude as our youngest city, Dawson City, in far famed Klondike.

After an existence of more than 400 years the Greenland settlements were given their *coup de grace* by the Eskimos, and all that now remains as evidences of the 300 farmsteads, the two

villages and the 14 churches and one cathedral are the ruins of a few stone houses and of the Kakortok Cathedral church "where the credo was intoned and censers swung while not less than ten generations lived and died.*

Bjarni Hergulfson, another Icelander, on his way from Iceland to Eric's settlement to see his father, driven by storms out of his course, sighted land far to the south and slowly made his way back north to Greenland, seeing land occasionally as he went.

Interested in the account of Bjarni's adventures, Lief, the son of Eric, sailed in the summer of 1000 to the south till he came to a land of slate. This he called Helluland or Slate land. Pursuing his voyage southward he came to another country which he called Mark land or Wood land. Then turning west he reached a third region which he named Vinland, because wild grapes grew there. He had skirted the shores of Labrador, Newfoundland and Nova Scotia.

The Icelanders, the Norwegians and the Swedes—the men of the north—having shown the way, the men of the south put in their claim to good seamanship, possibly led by that instinct which has ever influenced the dwellers in one zone to search the countries of other zones for purpose of trade; as witness the colossal processes of Empire-building now right merrily going on, the greatest the world has ever seen; the Russians, the Germans, the French and the English nations (the Unistoniams not by any means to be omitted) all stretching out their hands for tropical countries and watching each other with keen eyes lest in the partition of Africa and the breaking up of China any one should get bigger pieces than the others. Canada, having consolidated herself from ocean to ocean by the successful achievement of the great work of Confederation, bristling as it was with many difficulties, is not without signs that she too may feel herself drawn by the magnetic force of dissimilarity, with its consequent natural expansion of trade, to enfold within her embrace the British Tropical West Indies.

Whatever the impelling cause the men of the south in that day and time in the history of the European people essayed to explore the north, the process being the opposite of that of the present era when the movement is from north to south.

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*Fiske's "Discovery of America."

The Venetians, Nicolo and Antonio Zeno (1384-94)—the first of that glorious sextet (Columbus, Vespuccius and the Cabots and the Zenos) of Italian navigators to put the world under deep obligations to them for discoveries extending the knowledge of the earth's surface—did a little exploring the account of which, for a long time believed to be fabulous, is in recent years considered to be genuine.

Antonio and Nicolo at different times visited Greenland. Whether either of them visited the mainland of the continent or any of our islands is in doubt.

The two Cabots, John and Sebastian his son, hold the first place in point of time* and in many respects the first in importance from a Canadian standpoint. John Cabot in 1497 discovered the South Eastern coast of the present Dominion of Canada, landing on the coast of Cape Breton, so it seems to be settled by a writer in the "Encyclopaedia Britannica†" and an increasing number of the ablest writers. Wherever he made his landfall, he did so, it is contended by John Fiske‡, on the same day of the same year that Americo Vespuccius first saw the South American continent with which his name was first associated through a curious error of a German cosmographer, to be subsequently extended to the northern part of this western hemisphere, which ought, in agreement with the eternal fitness of things, to memorize John Cabot, who first took possession in the name of King Henry VII of England.

Sebastian Cabot who accompanied his father on this occasion, made another voyage in 1498. He appears to have studied carefully the whole subject. His father's inquiries among the Icelandic sailors who frequented the Port of Bristol had led him, in all probability, to conclude that the shortest way to land beyond the Atlantic was by the old Norse track. Sebastian profiting by his father's observations and being himself a man of genius concluded to sail northward. He left Bristol in May, 1498 and headed for Iceland. On arriving there he steered for Cape Farewell

*The application of John Cabot for letters patent in favour of himself and his three sons, Louis, Sebastian and Sanctus is the earliest document of the archives of the Colonial Empire of Great Britain.—Goldwin Smith, "The United Kingdom, a political history."

†C. f. J. Winsor's Narr. and Critical Hist. Am. Vol. III pages 23, 24.

‡C. f. J. Fiske's Discovery of America Vol. II page 87.

from which cape he attempted to force a passage to the north, in the course of which he seems to have discovered the great strait now called Hudson Strait. Having failed to find the passage he sought, though he went a full degree north of the Arctic Circle and within 22½ degrees of the North Pole, he sailed southward for full 900 miles along our magnificent eastern sea-front, Gomara relates that Cabot had with him five vessels and 300 men. the latter intended to form a colony. Thevet, a French cosmographer, says Cabot landed these emigrants where the cold was so intense that nearly the whole company perished, although it was the month of July. If it be true that he put them ashore and that they perished, then these men must be added to Eric's 350 already mentioned as lost in the attempt to discover and people the northern regions of the Canadian Dominion.

Sebastian returned to Bristol, having made the very first voyage ever made with the specific object of finding a North West passage. He thus stands out prominently not only as the companion of his father in the voyage which led to the discovery of south eastern Canada, but also as the first man who divined that this continent was no outlyer of the Asian continent, as Columbus supposed, but was a huge barrier between Western Europe and Eastern Asia. He was also fore-runner of a long and illustrious line of seamen who, during more than two centuries sought for a short cut to Asia by a polar passage from east to west.

In the later years of his life after Edward VI in 1549 granted him a pension and created him King's Grand Pilot he conceived another idea, viz. of seeking the way to Eastern Asia by a North East Passage. The commercial association to which Cabot's genius and influence gave rise called themselves "The Company of Merchant Adventurers*." They received a charter of incorporation in 1554-5. In 1556 they obtained an Act of Parliament incorporating them as the "Fellowship of English Merchants for Discovery of New Trades," a title under which they continue incorporated though they are better known as the

*One of those trading associations which sprung from the necessities of the times when the sea was still an element outside of law and where to trade in safety it was needful to organize associations each strong enough to form a sea power, for piracy was common and half licensed and mariners of different nations warred with each other though their governments were at peace.—G. Smith.

Muscovy or Russian Company. Cabot became Life Governor, and because of his position and experience had much to do in shaping the policy and preparing the plans of the company. He instructed the captains in the company's service to observe closely the variations of the magnetic needle and for that purpose introduced the Log Book, declared to be the most admirable of all the inventions for the furtherance of the science of navigation, ranking, probably, in the minds of practical seafaring men next to the three "L's" of the sailor, the Lead, the Log and the Lookout.

The first expedition the Company despatched was that of Willoughby and Chancellor in 1553, before they obtained their charter. The departure of the pioneers with their three Bonas—*Edward Bonaventure*, *Bona Esperanza and Bona Confidentia*, as their ships were named, is described by a reporter of the day; "At Greenwich the common people flocked together; the courtiers ran out; the Privy Council looked out of the windows, and the others ran up to the tops of the towers. The ships shot off their ordinance insomuch that the hills sounded therewith. The valleys and the waters gave an echo and the mariners shouted so that the sky rang again with the noise thereof. From every point of vantage on shipboard the men wave their farewells. One stands on the poop of the ship and by his gestures bids farewell to his friends. Another walks upon the hatches. Another climbs the shrouds. Another stands upon the main yard and another in the maintop"—and thus with cheering and waving of hats and hands the vessels pass on and out of the historic river on their perilous voyage.

Thus has it ever been when Britain sends out her "Tommy Atkins" and her "Jack Tars" to encounters in which there are sure to be dangers and likely to be deaths.

Sir Hugh Willoughby discovered Nova Zembla—or as it is called now Novaya Zemlya, "the Newland," attempted to winter in Lapland and perished with the crews of his two ships. In all 70 men were frozen to death. The poet says of the cold that it

> ——To the cordage glued
> The sailor, and the pilot to the helm,"

and thus, two years after, some Laplanders found Willoughby's ships uninjured, as sound as when they sailed away from the Thames followed by the hearty good wishes of high and low.

But the 70 dead bodies all silent gave no welcoming cheer to the Laps. They had died at their posts like Englishmen.

Chancellor explored the White Sea to the mouth of the "Dwina," left his vessels and travelled overland to Moscow, tried the journey a second time and was drowned when returning to England in 1556.

Interest attaches to the expedition of Willoughby and Chancellor because of Sebastian Cabot's connection with it. Cabot drew up the instructions for the conduct of the expedition being too old and infirm to take personal command. He did not confine himself to the scientific part. One clause in his instructions directs that "no blaspheming of God, or detestable swearing be used in any ship, nor communication of ribaldry, filthy tales or ungodly talk be suffered in the company of any ship; neither dicing, tabling, carding or other devilish games to be frequented whereby ensueth not only poverty to the players, but also strife, variance, brawling, fighting and oftentimes murder, to the destruction of the parties and provoking of God's wrath and sword of vengeance."

In the same year that witnessed the drowning of Chancellor we catch a glimpse of the first navigator to look upon the shores of the Arctic fringe of Canada from an English ship. In that year Stephen Burroughs, who had sailed with Chancellor, was sent to the north in a small pinnace called *Searchthrift*. Previous to sailing from Gravesend, the right worshipful Sebastian Cabot and a large party of ladies and gentlemen paid a visit to the vessel and afterwards, says the chronicler, "the good old gentleman, Master Cabot, gave a banquet, at which for very joy that he had seen the towardness of their discovery, he entered into the dance himself among the rest of the young and lusty company." The "good old gentleman" was then over eighty years old.

I have dealt thus lengthily with Sebastian Cabot, 1st, in order to bring all the relevant events of his life together for the purpose of showing that in the discoverer of the eastern side of the country now called the Dominion of Canada, we have a hero of whom we may be proud and justly so, and, 2nd, To show that his discovery first at its south-east corner and then at its north-

east corner is the foundation of the claim that England made in after years to the proprietorship of this country including Hudson Bay and the islands forming "our northern fringe."

The Cabots' voyages were the first of those westerly sailings which are the title deeds of Canada as the Empire's Trustee.

When the union of the provinces after many years of discussion, more or less polemic and academical, came within the sphere of practical politics by the assembling in 1865 in the city of Quebec of the body of public men known to us of the present generation as "The Fathers of Confederation"—a sadly minished body to-day—there was much talk and much writing in the newspapers about the name by which the young auxiliary nation should be known. Among many suggested, Cabotia seemed, especially in the east, to be the favourite. Other considerations rather than historic justice dominated the minds of the "Fathers," and the place-name "Canada" was selected and given the wider application to suit the new conditions.

We have not altogether slighted the memory of the first navigator who sailed along the eastern sea-front of this country. In the more recent maps of the Dominion the name Cabot Strait, to designate the passage connecting the gulf of St. Lawrence and the Atlantic Ocean between Cape Breton and Newfoundland, fittingly commemorates the earliest discoveror of this country. It is, I believe, the only Cabot place-name in Canada.

Perhaps when the United States take their place within the Empire the part of the continent staked off for the Britishers—Canada included—may receive the general name of Cabotia. Who knows?

To go back to our story. In 1500-01 a Portuguese explorer, Gaspar Cortereal, moved thereto by knowledge of the Cabots' voyages of 1497 and 1498 and by desire to see if some of the land visited by Cabot lay east of Borgia's Meridian* and could there-

*Borgia's Bull was a decree issued by Rodriga Borgia, Pope Alexander VI., by virtue of which Spain had conferred on her Sovereigns the possession of all lands discovered or to be discovered lying west of a meridian 100 leagues to the west of the Azores and Cape Verd Islands. A year after (1494) the line was removed to a distance 370 leagues west of the Cape Verd Islands. This would correspond to a line between the 41st and the 44th meridians west of Greenwich. East of this line lands discovered, or to be discovered, belonged to Portugal and west of it to Spain.

fore be claimed by Portugal, set out on a voyage to the Labrador coast, touched at Greenland, and possible entered Hudson Straits and the gulf of St. Lawrence, perishing on his second voyage with all his crew. His brother Miguel in 1502 with three ships going in search of him met the same fate, the two brothers and their shipmates being the earliest recorded victims of pelagic voracity in the northern waters with the exception of Red Eric's emigrants and of Bjarni Grimolfsson with part of his crew whose fate (1010) is so pathetically told in the Saga Thorfinns Karlsefnis.

Down to 1560, 42 voyages of discovery had been made. These may be deemed early efforts to penetrate the arcana of the north. Of the 42, eight were by French, eight by English, six by Swedish and Norwegians, six by Icelandic, two by Venetian, seven by Spanish and four by Portuguese navigators. But with the exception of those of the Cabots and the Cortereals they do not concern us for the present purpose.

We come to the Elizabethan age (1559-1603), that age so marked by splendid achievement that even the marvels of the Victorian age have failed to thrust it into the back-ground. Eleven voyages of discovery by English navigators mark that era as the special period of English hyperborean adventure, the records giving but ten voyages by all other nations during Elizabeth's reign—one Danish, one French, three Dutch and five Spanish.

The high latitudes of Canada were the scene of the achievements of Frobisher and Davis.

Martin Frobisher deemed the discovery of the north west passage the only thing in the world that was left undone by which a "notable mind might be made famous and fortunate." There have been many notable minds made famous and fortunate since Frobisher's day without reference to the North West Passage, so that in all liklihood Frobisher was what we should call a "crank" on the subject. He had studied the question of circumpolar navigation very closely. To him, to Gilbert and to Willes was due the resumption of the awakened interest in the discovery of a North West Passage, which had slumbered from the time the Muscovy Company, under the powerful influence of Cabot, directed its attention to the North East Passage; for

Cabot, after his experience of western ice-bergs and ice-packs, had abandoned the idea of a practicable North West passage, had devoted himself to other projects and had been dead two or three years when Frobisher began to agitate in favour of a renewal of the attempt to attack the problem from the Greenland side. After long and persistent efforts he succeeded in interesting persons of means and influence in his project and in 1576, nineteen years after Cabot's death, he, mainly by the help of the Earl of Warwick, obtained two vessels—the *Michael* and the *Gabriel*, one of twenty-five tons and the other of twenty tons burden and a small pinnace, with crews all told numbering thirty-five men. With these he sailed from the Thames, cheered with a message from the Queen herself.

By Willes, Gilbert, Stephen Burroughs (the celebrated North Eastern Arctic explorer of the day), Dr. John Dee (the official adviser of the Muscovy Company), Richard Hakluyt, Michael Lok and others well versed in such matters, he had been assisted with all the geographical knowledge of the day. Among the subscribers were Queen Elizabeth, who took £4,000 of stock, Lord Burleigh, the Earl and Countess of Warwick, the Earl of Leicester, the Earl and Countess of Pembroke, Sir Philip Sidney, Sir Thomas Gresham, Sir Francis Walsingham and Michael Lok (who subscribed £5,000)—the total subscription being £20,000.

Frobisher's agitation of the question had created so widespread an interest that to him may be attributed justly the truly national character which from his time onward Arctic research assumed.

The list of subscribers, as is evident from the partial mention of the names, included many of the famous names of the age. Every history of the times is studded with the names of the men who hurried to sign the subscription books for Frobisher's Arctic exploration.

From the Thames, Frobisher directed his course to the Shetland Islands. In the storm and tempest that swept the ocean the pinnace was lost. Soon after that calamity overtook him, the *Michael* deserted. The *Gabriel* kept on her northwestern course, was nearly wrecked on Greenland's rugged coast, and finally after a two months' voyage arrived at land to the north of the out-rushing waters of the strait now known as Hudson. The first land he sighted he named Gabriel Island,

after the staunch little vessel that had carried him thus far in safety.

This is the first place-name given in the high latitudes of North Canada that has remained.

Cabot called the strait Rio Nevado*—the river of snow—and Cortereal named it the Anian Strait† believing it, from its outrushing water, to be the eastern or lower end of the passage through which a vessel might go to Cathay. But the Cabot name never fastened itself, and the Cortereal name so confused the geographers that by 1556 it was applied to the north and south passage between Asia and this continent to continue so applied till it, too, found a place in the ash-heap of lapsed and and discarded names, Behring's name being properly substituted, though not before many a navigator had vainly hunted high and low for the Anian Strait on both sides of this continent.

On this voyage Frobisher named Prior's Sound, Thomas William's Island and the Five Men's Sound, in which latter body of water was one Island he named Trumpet Isle, and a second he called Butcher's Island.

He landed on the last named on the 19th August, and on going to the top of it to see if there were any people or no, he says "he had sight of seven boates which came rowing from the east side." With the occupants of these he made acquaintance and gave them "thridden points" (sewing needles).

This was the first acquaintance of Englishmen with our fellow subjects the Eskimos, and of the Eskimos with the predecessor of the modern needle which plays or plies so important a part in domestic economy that like the telephone we don't know how the world got along without it. Frobisher describes the natives: "They be like the Tartars, with long black haire, broad faces, and flat noses, and tawnie in colour, wearing sealskins as

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*Cortereal is supposed by some to have named the straits (Hudson) Rio Nevado, and Dr. Richardson says the name *Nevado* has been transferred to some mountainous islands on the north side that even in summer are covered with snow. I have followed Asher ("Henry Hudson, the Navigator," page 257.)

†There has been much discussion about the derivation of this word. The most generally accepted idea is that mentioned above. It has often occurred to me that Cortereal possibly named the strait Anian, not because of its supposed end of a passage through the continent, but because of the great number of eider and other duck he found there; that bird being ornithologically a member of the anas family—anas molussima.

also doe the women, not differing in fashion from the men, but the women are marked in the faces with bleue streakes down the cheeks and round about the eies,''—from all which it is apparent that sealskin coats, made to look like men's, and painted cheeks are no modern fashion among the women of this continent. The first wearers and users, our comely sisters of the northern fringe of Canada, set the fashion no one knows how many centuries ago.

''On the 20th day,'' continues Frobisher, ''we wayed and went to the east side of the island,'' where they saw the Eskimo's houses. One of the natives returned to the *Gabriel* with them and to him they gave a '' belt and a jack-knife and then ordered five men to put him ashore at a rocke and not among the company (of the Eskimos) but their wilfuleness was such that they would goe to them and so were taken themselves and we lost our boate.''

''The next day in the morning we stoode in near the shore and shotte off a fauconet and sounded our trumpet but we could heare nothing of our men. This sound we therefore called the Five Men's Sound.''

The fate of the five men is unknown ; whether they settled down and took to themselves Eskimo wives and left a white strain in the blood of the natives or whether they were eaten without salt or roasting no one knows ; no trace of them was ever found.

Trumpet Island was probably so called because of the echo of the sounding trumpet the island's precipitous sides returned as the messmates of the five abducted seamen sought to inform the unfortunate quintet of their whereabouts.

This first acquaintance with our brothers and sisters of the seal-skin garment has not been improved or deepened since. We know in a general sort of a way that there are about 4,000 of them included in our population and even that is an estimate now 30 years old. Missionaries have gone from Canada to the heathen of Asia and Africa but to these little people of the land of the white bear we have paid scant or no attention. Dr. Richardson and McClure and Armstrong found them very unwilling to cultivate closer relations with the Kabloonas, or white men, '' because the white men gave them water that killed them,'' to which fateful gift they have decided objection. Possibly by preserving a ''splendid isolation'' they have increased and multiplied. But they have been left to their paganism by the mission societies, almost their only point of contact with white men being at Herschell Island near Mackenzie River where whaling ships often

winter, and possibly on the Labrador coast where the Moravians have established missions. The Indian Department here has not brought them within its fold. In fact the Innuits of Canada's northern fringe may truly say "no man careth for our souls" and yet they are the most interesting of all the races on this continent for many reasons that cannot be given in detail.*

Having to abandon the men, Frobisher returned to England taking with him some gold which may be considered the first discovery of the yellow metal on the Arctic slope of the country known as the Dominion of Canada, the harbinger of the coming time when in a single season more men rushed towards Canada's part of the Arctic Circle for the gold of the Klondike than during four centuries manned all the barques of all nations seeking fame and the North West and North East passages to Cathay and the land of the tea plant.

In consequence of the rumors which soon circulated of the value of the "find" great enthusiasm prevailed in England, and Frobisher had no difficulty in obtaining the means for another expedition. The Queen contributed £1,000 and loaned a ship of 200 tons from the Royal Navy. With this ship and his former vessels and a complement of 120 men, Frobisher sailed and arrived at Hall's Island on the third week of July, 1577. He named the Island after the captain of the Royal ship; the Queen's Foreland in honour of Queen Elizabeth, and Best Island after his second lieutenant, who was also the chronicler of Frobisher's second voyage. His own name was given to Frobisher Strait, the belief being that it was a strait, and not, as we now know it to be, a bay. Jackman Sound was named after the master gunner of the "Aide," the Royal ship.

At one stopping place the Eskimos made a fierce assault upon his men "with their bowes and arrowes." In self-defence he wounded three of the natives. These fearing to be captured, in their desperation leaped off the rocks into the sea. "We named the place Bloody Point, and the bay or harbour Yorke Sound, the latter after the Captain of the Michael."

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*I have recently learned that the Anglican Church has two or more Missions among the Innuits of our Northern Fringe.

The chief object of this expedition was to collect "black earth" to be taken home and tested for gold. They anchored in a fair harbor, which they named Anne Warwick's Sound, giving the name also to an island in honour of the Countess of Warwick, who, with her husband the Earl, had enthusiastically promoted the first expedition."*

After filling up with black earth and making earnest but fruitless efforts to discover the fate of the five men, Frobisher returned to England where he was greeted with great enthusiasm, the Queen naming the great island from which the "ore"† was chiefly obtained, *Meta Incognita*, and throwing a chain of gold around Frobisher's neck.

A larger expedition was planned, and in 1578 Frobisher sailed on his third voyage with two of the Queen's ships, one of 400 tons and the other of 200 tons burden. Besides these, thirteen vessels of various sizes accompanied him. With him were 120 pioneers and 400 other men, of whom 100 were designed for the special task of forming a colony. These were landed in Frobisher Bay, and at the time were considered to be "the first known Christians that we have true notice of that ever set foot on the soil" of that part of the Dominion of Canada.

Things however, did not turn out according to expectation. One of the ships was lost. Ten persons died. The others appear to have resolved not to remain. Stormy winds and dangerous ice frightened them. On one occasion the chronicler says, "Thus continued we all that dismal and lamentable night in this perplexitie looking for instant death."

October found the joyful survivors with their feet on English soil ; and so ended one of the early efforts of the sturdy English in the line of colonizing, a line in which from natural aptitude, and after long and sometimes bitter experience, they have no equal among the nations ; Spain, France and Italy all failing, and Germany as yet giving no great evidence of special

*Captain Hall in 1860-62 discovered the remains of the stone house which Frobisher built on Countess of Warwick's Island in 1577, as well as other relics of the great navigator. These latter he sent to England; a more appropriate resting place for them would be Ottawa, the Federal capital.

†The worthlessness of Frobisher's ore resulted in luckless Michael Lok being unable to redeem his suretyship. He was cast into Fleet prison, a catastrophe which involved himself and his fifteen children in ruin.

readiness and skill as a colonizer of the waste places of the earth

It has been said that the Russians are the best linguists of Europe because every other language is so easy in comparison with their own. Possibly the British have found it easier to colonize the whole earth because their earlier efforts were directed to the bleak parts ; after conquering these it was child's play to conquer the rest.

Frobisher took back to England the information that between 62° and 63° on the eastern side of North America a wide entrance existed, navigable for hundreds of miles, and that a still broader and more navigable entrance had been found between 60° and 62°. "This information was more than sufficient to raise the most lively hopes of a through passage and the most ardent aspirations towards its discovery, especially in an age that may well be said to have given birth to the buoyancy and elasticity of spirit by which the English nation has since become so great."*

Though Frobisher exerted himself to his utmost to secure the means for a larger expedition ; though he was supported in his efforts by England's great seaman, Francis Drake, who offered £1,000, when he could ill afford it ; and though the Earl of Leicester subscribed £3,000, the enterprise came to naught ; and thus passes out of our specially Canadian story, the man Frobisher, who is justly regarded as one of England's great naval heroes.

He had the Yorkshireman's faculty for getting on in the world. After he abandoned Arctic exploration he commanded a ship in Sir Francis Drake's expedition to the West Indies and in 1588 he did such excellent work in the "Triumph" against the Spanish Armada, that he was rewarded with the honour of knighthood. In 1594 he took part in the seige of Crozan, near Brest, received a wound, was taken to Plymouth, and there died.

Frobisher's voyages are also "western sailings" in the account of which we read our "title deeds" to the "Northern Fringe" of our country.

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*G. M. Asher.

The next of the hardy English navigators whose explorations are "title deeds" was John Davis.

John Davis was born in Devon, that fruitful mother of great seamen, whose impress upon the history of England is out of all proportion to the population of the county.* By them Newfoundland was discovered. These adventurous old Devonshire sailors year by year left their little ports to reap the harvest of the seas along the shores of the great island, which in their homely way they called the "new found land." By them the ancient colony was largely peopled in the first instance. Prowse in his history of Newfoundland says, "Many peculiarities of the colony can be traced to our Devonshire forefathers." One of these, germaine to our subject, is that all the lakes in Newfoundland are called ponds, the reason for which is that in the south west of England there are no lakes, only ponds, a curious transfer of a familiar name from one side of the ocean to another.

From Devon came the friend and playmate of John Davis, Sir Humphrey Gilbert, whose pathetic fate off our south eastern Canadian coast is told in song and story which have enlisted in his behalf the sympathies of the school boys and school girls of Canada from the time of the first English school in Halifax 150 years ago.

From Devon also came Gilbert's half brother, Sir Walter Raleigh, who planned the strategy which conquered the Spanish Armada, and whose fame is commemorated by a tablet erected in Westminster Abbey on which is inscribed, "Raleigh, the founder of the English Empire in America."

Another Devon man was Sir Francis Drake, the first of Englishmen to circumnavigate the globe, the vice-admiral of the English fleet when the Spanish Armada swept the British Channel, intent on the invasion of the British Isles.

Sir Redvers Buller, who planned the three marvellous springs of the British Lion at his prey, on Dec. 10th (Gatacre's) 11th (Methuen's) and 14th (Buller's)—which, when the sad clash of

*Devonshire, the county of cream, has well been called the cream of counties, from the illustrious men and history-makers it has produced, and it is still as prolific of sailors and soldiers as it was in the days of Drake and Raleigh and the other west county paladins of the good Queen Bess.

arms of British and Boer on South African veldt and daal and boschveldt shall have passed into history, will, I believe, be deemed wonderful though unsuccessful displays of energy—is also one of Devon's treasured sons.

John Davis, one of the greatest navigators, was associated with Sir Walter Raleigh and Adrian Gilbert in a charter granted them by Queen Elizabeth in 1584 for "the discovery of a new North West passage to China." Their interest in the enterprise was awakened by a book on the possibility of the discovery of a new North West passage written by Sir Humphrey Gilbert. William Sanderson, who had married Raleigh's niece, supplied the greater part of the needed funds. On June 7th, 1585, their expedition left the Devonshire port of Dartmouth. It consisted of two barks, the *Sunshine* of London (50 tons) and the *Moonshine* of Dartmouth (35) tons). They were determined to have some sort of *shine* to keep them company and a very good resolve it is, not only on Arctic voyagings but in all life's daily round.

On July 20th, writes John Janes, merchant-servant to the worshipful Master William Sanderson, "as we sailed along the coast (of Greenland) the fogge brake up and we discovered the land which was the most deformed, rocky and mountainous land that we ever saw. The first sight whereof did shewe as if it had been in forme of a sugar loafe standing to our sight above the cloudes, for that it did shewe over the fogge like a white lifte (rift) in the sky, the tops altogether covered with snowe and the shore beset with yce (ice) a league off in the sea making such urksome noise as that it seemed to be the true patterne of desolation and after the same our captain named it the Land of Desolation."

In accordance with a not uncommon experience this place-name is now applied not to the whole region but to one particular spot, a headland called Cape Desolation.

On the 6th August, Janes writes "Anchored in a very fair rode under a very brave mountain the cliffs whereof were as orient as gold. This mount was named Mount Raleigh. The rode wherein our ships came to an anker was called Totness Rode. The sound which did compass the mount was named Exeter Sound. The foreland towards the north was named Cape Dyer and that towards the south was named Cape Walsingham."

The mount was, of course, named in honour of Sir Walter Raleigh who would have been with the expedition but the Queen would not let him go, being unwilling to deprive her court and herself of his handsome presence and his beautiful legs.

Totness Road was named after Totness near Dartmouth, probably because their ships had been fitted out there. Exeter Sound commemorated the chief town of their loved Devonshire. Cape Walsingham received its name in honour of Sir Francis Walsingham, one of Queen Elizabeth's famous statesmen, a diplomat often at his wit's end through Queen Elizabeth's extraordinary vacillations, yet serving her and his dearly loved England with great energy and wisdom and with a stout independent English heart. He had endeared himself to Davis because of the help he had given to Sir Henry Hakluyt and other navigators in their voyages of discovery.

Cape Dyer was named after a personal friend, Sir Edward Dyer, Chancellor of the Order of the Garter.

On the 14th August, Janes writes, "we came to the most southerly cape of this land which we named Cape of God's Mercy as being the place of our first entrance from the discovery"; meaning that having explored the strait now called Davis Strait and from a point within the Arctic Circle having gone south homeward bound they desired in this way to express their gratitude to God for their preservation. Those old-style sailors were God-praising men, in their own way.

The coast line they had explored was named Cumberland and the sound of which Cape of God's Mercy is the northern headland they named Cumberland Sound, after another friend of Davis, George Clifford, Earl of Cumberland.

From Cape of God's Mercy they returned to England and were able to report that they had sailed round the southern point of Greenland, had gone north along the west coast of Greenland to Gilbert Sound which Davis so named in remembrance of his old playmate, the hapless Sir Humphrey, who had perished in the foundering of his little 10 ton vessel, the *Squirrel*, off the coast of Nova Scotia encouraging his men by calling out "we are as near heaven by sea as by land"; had crossed the strait now called Davis Strait and had reached the western shores of the continent on the 6th August, at Cape Walsingham, and had explored the

coast for several days, leaving on the 24th August, and reaching England on the 30th, September. By an admirable course of reasoning he gave his conclusion that "Davis Strait does lead to the Pacific."

Encouraged by his report, the promoters sent him out again, this time with four vessels—the "Sunshine," and the "Moonshine" (as before,) the "Mermaid" (100) tons and the "North Star," a pinnace of 10 tons. They arrived in Gilbert Sound at the end of June and began searching for other openings besides those found in the previous expedition. Soon they encountered huge packs of ice. The crew of the new ship the "Mermaid" had not seen the Arctic regions before. They quailed in front of the huge icebergs and at length mutinied. They were partially subdued by his imposing presence and entreated him "not through over-boldness to leave their widows and little children to give him bitter curses." He sent the "Mermaid" home. He himself continued his exploration and found two more openings, Davis Inlet and Sound and Souctoke Inlet. On the 21st August, they were in Gilbert Sound where, according to the narrative, the natives whose confidence he sought to win through the sweet medium of music "did on divers times woo us on shore to play with them at the football and some of our company went on shore to play with them and our men cast them down as soon as they did come to strike the ball." Thus early was football introduced in the hyperborean regions and body-checking indulged in. Davis soon after that set sail for England, as he passed naming Cape Farewell on the extreme southern point of Greenland and arrived home in the beginning of October.

On the 19th May, 1587 Davis left England on his third voyage having with him his favourite vessel the "Sunshine" and the "Elizabeth," and a clinche named the "Ellen of London" and on the 30th June, had reached latitude 72° 12, nearly four degrees further north than any one had been before in that sea. He saw before to him to the north "no ice, but a great sea, free, large, very salt and very blue" and "it seemed most manifest that the passage was free without impediment towards the north." Northern gales and the wish to proceed towards the west prevented him sailing further in this northern direction. He tried to sail westward and succeeded in going 44 miles deflecting but

slightly to the south. The winds, however, drove the ice upon him and he had to retreat towards the Greenland coast and finally he gave up the attempt in that latitude and reached his old anchorage beneath Mount Raleigh. He then explored the Cumberland Strait hoping to find a passage but the ice was too strong a barrier. He returned to the mouth and sailed southward. He passed Frobisher Bay and Hudson Strait noting as he crossed the latter "that the sea fell down into the gulf with a mighty overfall and roaring and with divers circular motions like whirlpools, in some sort as forcible streams pass through the arches of a bridge."

On this voyage he named the most northerly point he reached in Greenland "Sanderson his hope of a North West Passage," (now in our maps cut down to "Sanderson's Hope,") after William Sanderson the London merchant whose public spirit had induced him to supply the means for the expeditions with which Davis's name is connected. He also named the Cumberland Islands, Lumley's Inlet and Cape Chidley, the latter after a Worthy of the times deeply interested in Arctic exploration. He reached England in the middle of September and his further history concerneth us not in this connection. Canon Taylor says, "Davis needs no tomb-stone, as he has written his name conspicuously upon the map of the world."

In the 17th century, after Queen Elizabeth's death, the records show 20 English voyages of discovery, 8 Danish, 6 Dutch, 5 Russian, and one Portuguese, in all 40, just one half of them English : Spanish and French dropping out altogether.

Of these 40, the ones of interest to us in connection with our District of Franklin are those of Hudson, Button, Bylot, Baffin, and Fox.

Henry Hudson claims the next place in chronological order, as one of the navigators whose "western sailings" are our "title deeds" to the northern fringe of Canada. But though he named Salisbury Island, one of the southern islands of Franklin District and therefore comes within the charmed circle of those whose fame is connected with the District which is to-night our special

study, yet his exploits are chiefly associated with Hudson Bay* and the southern lands of Hudson straits. I have prepared a full account of his deeds in our waters and elsewhere but must reserve it for some other occasion.

On account of the deep damnation of Hudson's taking off much interest was aroused in England and many attempts were made to ascertain his fate. In 1612 Sir Thomas Button sailed with two vessels. His first place-name was "Carey's Swan's Nest." His next was "Hopes Checked" and then on to Port Nelson at which place he wintered and then went North to latitude 65° the highest point he reached and somewhere near Cape Comfort. He, like Hudson, sailed within the boundaries of Franklin but does not seem to have been otherwise associated with its "title deeds."

A little less than a year after Button's return to England, the Muscovy Company—Sebastian Cabot's Company—sent out (1615) Robert Bylot and William Baffin who then and thus embarked on the first of the two voyages commonly associated with their names. They sailed from the Scilly Islands, April 1615, in the "Discovery" a vessel of about 55 tons in which Bylot had already made three voyages to the North West. Following a course already familiar to him they passed through Hudson Straits and went up what is known as Fox Channel. Here and at the western end of the Hudson Straits they spent about three weeks in exploring and then went back to England.

Their next voyage was one of greater interest and importance and ranks among the most famous of arctic voyages. They sailed from Gravesend on 26th March, 1616, with a ship's company numbering 17 persons and coasting along the western shore of Greenland and through Davis Strait they visited and explored both sides of the Great Sea that has ever since borne the name of Baffin Bay. On this occasion they discovered and named the important channel known as Lancaster Sound and also discovered and named Jones Sound, besides numerous smaller bodies of water and many islands since become familiar to Arctic voyagers†.

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*"Hudson Bay is both the tomb and the monument of the daring navigator who discovered it." Isaac Taylor; "Names and their histories."

†C. C. Smith in Justin Winson's Narrative and Critical History Vol. III, pages 93-94.

They discovered and named Savage Island, Cape Comfort (because of the hopes Bylot was then led to entertain of the existence of a North West Passage), Mill Island, (from the way the ice floes were ground up there by the rushing waters), Women's Island (because Baffin there found two or three native women), Horn Sound (because Bylot traded there with the Indians for sea otter and unicorn's horns), Wolstenholm Sound (after the second Sir John W. who aided Bylot and to whom Bylot wrote a long account of his explorations); and Hakluyt Island, the latter after Rev. Richard H. who collected and published in 1582 "Divers voyages touching the discovery of America and the principal navigations, voyages, trafficques and discoveries of the English nation made by sea and land," and is the first and greatest English compiler of sea voyages.

Lancaster Sound and Channel were named in honour of Sir James Lancaster, who aided to equip the Baffin expedition and was a Director of the East Indian Company and the first Englishman to sail round Cape of Good Hope to India (1591-4). Jones Sound was so named for Alderman Sir Francis Jones, a London merchant, who also aided to equip Baffin's expeditions.

Baffin also named the most northerly opening of Baffin Bay, Smith Sound, after a very important man in his day, Sir Thos. Smith, who was the life and soul of the East Indian Company during the first year of its existence. When James Lancaster came back to England after an absence of three years and reported the greatness of the field in India for English mercantile enterprise a few merchants sent off a ship for the purpose. The success of the venture occasioned the formation of a company and Sir Thos. Smith was its first Governor continuing to hold that office for many years. The marvellous career of the East India Company is sketched by Macaulay's graphic pen in his essay on Warren Hastings. After its doings had been the history of the English in India for nearly 260 years its political power ceased and the Queen was proclaimed Queen of India in 1858, subsequently being proclaimed, on Jan. 1st, 1877 at Delhi before the princes and high dignitaries of India, Empress of India — all these great events and this magnificent addition of India to the pages of British history springing from the action of a few merchants like Sir Thomas Smith.

To Baffin is due the fact that there are on the map of our District of Franklin, the place-names of Whale Sound, because of the number of whales they saw sporting there—those orators (spouters) of the deep being very abundant in that locality; Sir Dudley Digges Cape, and Carey Island, after promoters of the voyage.

Purchas says Baffin "died in the Indies slain in a fight, shot as he was trying his mathematical projects and conclusions," in order to find the range of the castle for his cannon. But though nothing is known of his later life "after years have verified all that this admirable old navigator ever asserted and his name will cling to the waters of the mighty bay he discovered as long as honest worth shall be recognized in the world.*

By Baffin the flag of England had been hoisted and possession taken of the lands and islands from Smith Sound south along the western shore of Baffin's Bay. Baffin is thus one of the hardy navigators whose "western sailings are our title deeds."

Fifteen years elapsed before any other attempt was made by the English to penetrate the maze of islands on the west shore of Baffin Bay.

Luke Fox in 1631 made a considerable exploration of Hudson Bay and named various islands, promontories and bays. Among the islands are Brooke-Cobham in honor of his patron, Sir John Brooke-Cobham, Briggs† his mathematics, etc. Among headlands are Cape Marie, Cape Dorchester, King Charles his promontory, etc. Sir Thomas Roe's Welcome is also his place-name.

Sir Thomas Roe was an eminent political agent who flourished 1568-1644. One of his missions was to the court of the great Mogul, 1615-18. His Journal is one of the leading authorities for the reign of Jahangir (the Great Mogul). Goldwin Smith says of him "the sage Sir Thomas Roe conjured the East India Company to content itself with factories and trade." Sir Josiah Child, on the other hand, in the reign of William III desired that

*Markham's voyages of William Baffin.

†Henry Briggs was a mathematician who promoted Fox's Expedition and wrote a treatise on the North West Passage. Evidently Fox did not want him to be confounded with any other of the Briggs family.

his company, should be a military power, and such it became, destiny compelling it to conquer and to annex.

Taylor says the name was originally given to an island and afterwards transferred to the channel in which the island lies, by either Button or Fox. It was given because the giver believed that it would be welcome news to Sir Thomas to learn that a channel had been found leading to the East. It is thus that through its place names our Northern Archipelago is associated with British India.

In 1670, as we know, the Hudson Bay Company was incorporated and soon established itself on the shores of Hudson Bay, there to begin that marvellous career which has been so well described by Beckles Willson.* They did not however, during the 17th century attempt explorations in the northerly regions. They had too much to do alternately protecting and fighting that curious product of the times, the freebooter Radisson ; defending themselves from that marvellous man, the French Canadian son of Charles Lemoyne, the Sieur d'Iberville ; and establishing themselves in the good graces of the Indians of the Hinterland.

During the 17th century the English despatched 16 exploring expeditions to the frozen ocean, the Russians 18, the Dutch 1, the Unistoniams then first entering the lists. The Hudson Bay Company despatched six expeditions at different times in fulfilment of an undertaking in their charter. One of them was commanded by Henry Kelsey, who is undoubtedly one of the heroes for whom we are indebted to the Hudson Bay Company. Forty years before Verendrye's journeys of discovery, Kelsey, then a young man, had penetrated (1691) the interior of Rupert's Land, had crossed the Assiniboine Country, had seen, for the first time among English and French explorers, the buffaloes of the plain, had been attacked by the grisly bears of the far west, and, in behalf of the Hudson Bay Company, had taken possession of the lands he traversed and secured for his masters the trade of the Indians hitherto considered hostile.* But though he was prosperous by land, in the two voyages he made by sea he does not appear to have made any discoveries of importance to our narrative.

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*Beckles Willson's " The Great Company," page 180.

The first water expedition of the Hudson Bay Company in search of a North West Passage was unfortunate. Opposite the names of the "Albany" frigate and the "Discoverie," the Hudson Bay Company had to write the ominous words, "never returned." For nearly half a century the fate of the men of that expedition remained unknown. Then (1767) some whalers connected with the Black Whale Fishery, the company was at that time carrying on, made Marble Island their rendezvous, and visiting its shores found English guns, anchors, and other articles lying about. When the tide ebbed the hulls of two craft were seen lying in two fathoms of water. Inquiries were made and in the course of a few years the details of the sad fate were pieced together. The two vessels were damaged and made the harbor; the crews, landing, set about building the house whose ruins had attracted the whalers. After finishing the house they seem to have set to work repairing the ships. The first winter passed and the succeeding summer faded into winter. By this time thirty of the fifty persons composing the company were dead. When spring advanced the Eskimos crossed over to the mainland. When they returned they found only five alive. These they supplied with food, seal's flesh and whale's blubber, which they in their distress devoured raw, and, in consequence, three of the five died. The two survivors, though weak, managed to bury their dead and for some weeks kept themselves alive. Hoping against hope, they frequently dragged themselves to the summit of a nearby rock to look for a relief party. At last they were seen by the wandering natives to crouch close to one another and to weep like children. Then one died and the last man of the fifty tried to dig a grave, but fell over the dead body of his fellow, himself a corpse. "The Eskimo, who told the story as he had heard it, took the whalers to the spot and showed them the skulls and larger bones of the luckless pair, then lying above ground, not a great distance from the dwelling."*

The uncertainty of the fate of the men of the "Albany" and the "Discoverie" was not the reason why so little energy on the part of the English appears in the 18th century. During the

*"Journey from Prince of Wales Fort in Hudson Bay to the Northern Ocean," by Samuel Hearne.

first half of it Englishmen were busy fighting battles on the continent, which called for every man England could spare. Blenheim and Ramillies and Malplaquet ear-mark the period for us. Sixty battles in fifty years leave little room for other work. In the early years of the century the exigencies of England were so great that the fleet was raised to 30,000 men and the army to 10,000, then deemed extraordinary figures indicative of great strain upon the nation's resources. John Churchill, Earl of Marlborough, who, as Voltaire notes, never besieged a fortress that he did not take or fought a battle which he did not win, was fighting his way to the Danube to win the battle of Blenheim. It was the day of the first of the great Commoners, Walpole and the Pitts. The century saw the Seven Years' War, which, opening *on land* with a brush between a small body of troops under Washington and a party of French under Jumonville at Fort du Quesne, and *on sea* with the naval engagement between Admiral Boscawen and the French ships "Lys" and "Alcide" in the fogs of the Newfoundland coast, soon kindled the world into a flame.

These acts were the "beginning of the end" of that contest for commercial control of the world which that first of Imperial Unionists, Sir William Petty, (ancestor of our Lord Lansdowne) recognized as already world-wide in his time, (1676) and for the prosecution of which Sir William, with a prescience that has kept his memory green, proved statistically that England had all the natural advantages necessary to ultimate success; Portugal and Spain having been pushed aside, the Netherlands reeling from the blows received and preparing to give way to France as the coming challenger of England's growing greatness. They precipitated the tremendous struggle, which, fought out to the bitter end on the plains of India, on the waters of the Mediterranean and the Spanish Main, on the Gold Coast of Africa, on the ramparts of Louisburg, on the Heights of Quebec, and along the valley of the Ohio, determined for ages the destinies of the world. With that struggle began the re-creation of Germany, its intellectual supremacy over the continent of Europe, its political union under the leadership of Prussia and its kings; the independence of the United States, and "the foundation of the unique Empire, which, unlike Russia and the United States equally vast, but not continuous, with the ocean flowing through

it in every direction, lies like a world-Venice with the sea for streets—Greater Britain."*

Under these conditions England had little time and inclination to push those "western sailings of hardy navigators which are our title deeds" to our Northern Island Fringe.

While British troops were occupying Boston in 1769, Samuel Hearne of the Hudson Bay Company was making his first attempt to find copper on the Coppermine River, an attempt, in which at the end of three years, during which he travelled 1,000 miles on foot or in canoes, he was to achieve success and to be the first white man to look upon the Arctic waters from the interior. As he describes the occasion, the weather was decidedly unfit for extended observation; a thick fog and a drizzling rain greeted him as he stood on a small eminence near the mouth of the river, cutting his name on a board in sign of the extension of the Hudson Bay Company's possessions to that point, else he might possibly have looked across the waters and seen the great island now called Prince Albert Land and included in the District of Franklin.

Though the English were not much in evidence in Polar seas during the 18th century for the reason that it was a fighting century with 194 battles as its record, Davis Strait did not lack visitors. The Dutch prosecuted the whale fisheries so vigorously that between 1719 and 1775 they had made nearly 6,400 voyages, an average of over 100 vessels a year.

The second decade of the century now nearly run out had not wholly passed when the English began to bestir themselves.

The Peace of 1814 had freed England from her American entanglement. With the battle of Waterloo had ended Napoleon's career as a conqueror.

Barrow is a frequent place-name in our Arctic possessions and along our northern littoral. Barrow Strait; Cape Barrow in Victoria Land; in Grinnell Land; in Coronation Gulf and near

*Professor Seeley: "Expansion of the Empire."

the Great Fish River ; Mount Barrow between the Coppermine and the McKenzie River ; Barrow Bay in Parry Islands ; Barrow Island, Barrow River and Point Barrow are instances. Parry, Richardson, Ross, Beechy, Back, Belcher, and Kane were the givers. There is a Barrow Bay in Corea and a Barrow Bay off the north west coast of Australia.

Sir John Barrow, in whose honor these many place-names were bestowed, was an ardent advocate of Arctic explorations. He wrote a great deal in favor of further investigation, believing that if a passage were found it would be of immense service to Great Britain in her commerce with India. He succeeded in arousing public interest in the resumption of efforts to solve the problem.

Parry's voyages and Franklin's followed, Barrow cheering them on ; his position as Secretary of the Admiralty Board—a position he occupied for forty years under eleven first Lords of the Admiralty, the esteemed confidence of all of whom he held as well as that of King William IV—enabling him to lend a helping hand. Before he became Secretary, he was employed to settle the Government of the Cape of Good Hope, and published two volumes on that important acquisition, whose name has been so prominently before the Canadian public of late. The perusal of that work induced Lord Melville to appoint him Secretary of the Admiralty, and thus to give him a position where he could exercise strong influence in favor of Arctic exploration. When our boys landed in Cape Town a little while ago, they landed in a colony that had been established by the man whose memorial tablets are scattered all over the Canadian District of Franklin.

Sir John Barrow—he received his baronetcy for his work in connection with Arctic exploration, like so many others knighted for service in the Arctic regions of Canada—Sir John Barrow used his great influence in a practical manner ; for by reason of his efforts the Parliament of Great Britain in 1818 passed an act for the promotion of polar discovery, by the terms of which a reward of £20,000 sterling was offered for making a North West Passage and of £5,000 for reaching latitude 89° north, while the Commissioners of Longitude were empowered to award proportionate sums to those who might achieve certain portions of such discoveries. Barrow lost no time in securing four vessels, two

to go by way of Spitzbergen, Cabot's favorite way, and two *via* Baffin Bay. The first were under the command of Captain Buchan and Lieutenant Franklin, being the first time the latter officer made a trip to the Arctics. The second two were under the command of Captain John Ross and Lieut. E. W. Parry. Both expeditions sailed in April, 1818. It was in these circumstances that John Ross came to be connected with our Arctic Island District.

Ross coasted along the west shores of Greenland, bestowing place-names all along the coast. When he arrived at the southern end of Smith Channel he named the two opposing capes—one on Greenland and one on our territory—Cape Isabella and Cape Alexandria, after his two vessels. He sailed south, naming the bays and islands and inlets he explored, and returned to England with the intelligence that the north water of Baffin Bay was a good spot for the whale fisheries, and it was accordingly utilized for many a year, bringing much profit to the nation.

In 1829, Ross, by the assistance of Sir Felix Booth, made a second voyage in which he entered Prince Regent Sound and went south along the eastern side of a land he named Boothia Felix. On August 16th he wrote in his journal, "I went on shore with all the officers, took formal possession of the new discovered land and at one o'clock the colours were displayed and the King's health drunk, together with that of the founder of our expedition after whom the land was named, Mr. Sheriff Booth, an old and intimate friend." Brown Island was named "after the amiable sister of Mr. Booth," and the harbour was named Port Elizabeth "in compliment to a sister of the patron of our expedition." He wintered in Boothia. He subsequently named and partially explored King William's Land to the west of the Peninsula of Boothia and passed two more winters in that region. As he could not get his vessel out he went to Fury Beach, where he passed his fourth winter, 1832-33. Eventually he and his men were picked up by a whaler in Barrow Strait and taken to England. I have counted more than 200 names conferred on places in Franklin territory by John Ross.*

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*Mr. Otto Klotz reminds me that Sir James Clark Ross, who was with his uncle, Sir John, on this expedition discovered (10th June, 1831) the position of the North Magnetic Pole on Melville Peninsula.

John Ross's second in command, was, as we have said, W. E. Parry. As Parry did not concur in the view held by Ross about the passages, reported by Baffin, being mere *inlets*, but believed that they were *straits* by which a North West Passage could be found, he was appointed to command another expedition, which sailed in the leafy month of May, 1819, and was formed of the "Hecla" and the "Griper" with a hundred men on board. With these vessels he entered Baffin Bay and passed through Lancaster Sound, the continuation of which he named Barrow Strait. He also saw and named Wellington Channel, after the Iron Duke, then Master-General of the Ordnance. Pressing onward he saw and named several Islands after his much loved western counties, for he was a Somerset man. On the 4th September the ships crossed the Meridian of 110° west of Greenwich in latitude 74°44′, by which fact the crews became entitled to the reward of £5,000 offered to those first reaching that meridian. To do honor to the joyful event, a bluff headland, off which the announcement was made, received from the men the name of "Bounty Cape."

He came at length, after a voyage of 300 miles from Wellington Channel, to land which he named Melville, in honour of Lord Melville, First Lord of the Admiralty, who, to judge of him by the frequency with which his title appears as a place-name (there are ten or a dozen places bearing his name) must have been a man whose heart was in the right place. Here further progress was stopped by that impenetrable polar pack which seems to surround the Archipelago, and was compelled to winter in a harbor on the south coast of Melville Island, called by him Winter Island. Parry was the first of the "hardy English navigators" whose "westerly sailings" we are following, to winter in our north country. There they wintered in a dark silence, broken only by the loud resounding blows which the hammer of intense cold now and then strikes upon the beams and sides of their ships—otherwise a silence so profound that one might easily fancy he could hear the clash of constant battle kept up in his veins and arteries—those great military roads leading from and to the citadel of the heart—as the microbes, friendly and unfriendly to human life, make of his body a battle-field, in which the prize is his continuance in health or his removal to the silence of the tomb. When the long Arctic night

of three months', over 2,000 hours, duration fell upon the two ships, Parry, to give amusement and at the same time edification, established a weekly paper, a theatre and a school, an example followed by later winterers in those regions. The paper was edited by Capt. Sabine, the eminent observer, and was called the "North Georgia Gazette and Winter Chronicle." It may have been a spicy journal, but I doubt if it had a "Frills" or an "Inez," to chronicle the doings and dresses of society's dames and damsels. The editor certainly had no news from far off lands. The Duke of Richmond, Governor-General of Canada, had a short time before died of hydrophobia in a barn near Ottawa and his remains had been buried with great pomp and ceremony in Quebec. England was seething and bubbling over with riots and outrages in its manufacturing districts ; starving agricultural laborers were burning hay ricks and her people were migrating to Canada and other countries by thousands. But of these Editor Sabine knew nothing and therefore could tell his readers nothing. He could tell them of the pale bright light of the moon, of occasional paraselenas, of the brilliant splendour of the Auroras, the constant presence of stars and the meteoric flash of ærolites and other celestial appearances, rather than of mundane matters. Possibly many a good story of thrilling interest was gathered from reminiscent Jack Tars, and many a witty paragraph evolved from the surroundings. The Prince of Darkness may have received special attention, for the region must have seemed his special realm, with darkness on the face of the land and the icy lanes.

The Theatre Royal opened with the play of "Miss in Her Teens" on the 5th of November, the same day the sun sank beneath the horizon not to rise again for nearly three tedious months. The fur-coated, yet very cold, audience sat it out and enjoyed it, for it is written "that when the actors advanced and hurrahed for old England, the whole audience with one accord rose and gave three of the heartiest cheers I have ever heard." In May following Parry undertook a journey across Melville Island and records that "the soil was in most cases barren, with occasional pieces of coal embedded in sandstone, but on the western coast vegetation was more abundant and game more plentiful."

In August the vessels went westward. A high and bold coast was sighted and named Banks land, and then, the ice pack preventing further progress in that direction, the vessels' bows were turned eastward, and the ships' company examined, as they pushed their way along, the southern coast of Melville Sound and Barrow Strait. Parry had sailed upwards of 30 degrees of west longtitude beyond any former navigator, and had seen the most westerly lands of the now called District of Franklin. In due time he arrived in England.

Sir John Barrow, commenting on this voyage says, 'We are proud, and justly proud of the name of *Cook*, but we venture to assert, without fear of contradiction and without meaning to derogate one tittle from the merit of that renowned navigator, that in no part of his career of discovery had he occasion to call into action all those personal exertions and mental energies which were perpetually demanded in, and essential to the safety of, the late expedition.''

Parry made a second voyage as commander in 1821, going to Repulse Bay and exploring some 200 leagues, nearly one-half of which belonged to the continent. He wintered near Winter Island in Repulse Bay and established a theatre, where, on the 17th of November, ''A shivering set of actors performed to a great-coated, shivering audience, the appropriate play of the ''Poor Gentleman.'' He went up the east coast of Melville Peninsula guided by the tracings on paper of a remarkably intelligent young Eskimo woman, whose untrained hand took as naturally to drawing as the hands of others of her tribe did to pilfering. He named the strait which separates the peninsula from the island north of it the ''Fury and Hecla'' strait, after his vessels. He did not succeed in finding a North West Passage and returned to England. Nothing daunted, the British authorities sent out three expeditions—one by way of Behring's Strait, the second under Parry by Baffin Bay, and the third under Franklin by land, to the continental shores of Northern America. Parry did little, his vessel, the ''Fury'' was wrecked and he returned to England ; his future acts, not being associated directly with Canada's archipelago of the north, concern us not.

I have quoted Sir John Barrow's opinion of Sir. Ed. Parry. You will see on the map between Coppermine River and

McKenzie River, Cape Parry. In bestowing the name upon that bold headland, Dr. Richardson, in 1826 wrote in his journal, "Cape Parry I have named after the distinguished navigator, whose skill and perseverance have created an era in the progress of northern discovery."

While Parry was taking possession of the islands of what is now known as Parry Archipelago, another ardent Arctic explorer was at work seeking to ascertain the bounds of the northern shore of this continent. This was the man in whose honour, and in that of his noble-hearted wife, twenty place-name tablets have been set up in the Queen's Arctic territory.

Sir John Franklin first became connected with Arctic exploration in 1818. He was born in Lincolnshire, April 16th, 1786, and was intended by his father for the church. But one day he and his companion seized the opportunity of a holiday to make a jaunt of a dozen miles to see what the ocean looked like. That day's enjoyment of the salt water aroused in him the determination to become a "salt." His father, thinking that a good solid experience of the discomforts of life in an ocean ship would make the boy long for the quiet of a parsonage, sent him to Lisbon on board of a merchantman. But the intended cure only confirmed the disease, and in 1800 when fourteen years old, the youngster was on the quarter-deck of the Polyphemus, a 74 gun ship, which a few months later led the line in Nelson's great naval battle of Copenhagen. During the next few years he was knocking around the world as is the custom of sailor lads. He was in Australia, where his vessel was wrecked, in India, in Portugal, in Brazil and in the Gulf of Mexico performing those duties which a young English naval officer in stirring times has to put his hand to.

When peace came after the battle of Waterloo, the young lieutenant sought and obtained an appointment on board a vessel in which it was proposed to attempt to cross the pole by the often tried way of Spitzbergen. The qualities which the young officer displayed recommended him to the London men who had polar enterprise at heart, and in 1819 he was placed in command of an expedition whose object was to find the Arctic Sea by the overland route through our North West Territories, then known as Rupert's Land.

There was not much known of our Arctic Coast at that time. Samuel Hearne, as we have already seen, had discovered the Coppermine River, and thus had become known as the first white man to visit our Arctic shores. Though it was not part of his work to investigate the ocean, there is no doubt that he realized that he was looking on water that was salt. He was a salt water mariner as well as land traveller.

When Franklin was a "wee" baby of three summers, Alexander McKenzie was forcing his way down the valley of the "Big River" as it was called for many years till Franklin himself gave it the name it now bears—McKenzie River—in 1825, as he stood on the eminence from which McKenzie, 36 years before, looked upon the great ocean of the North, the first white man to do so.

Excepting the mouths of the McKenzie and the Coppermine rivers, nothing was known of our Arctic Coast line when Franklin and his companions set foot on our shores at York Factory in Hudson Bay and began organizing their expedition. His first winter was spent on the banks of the Saskatchewan. During the succeeding summer he was treading closely in the steps of Hearne down the Coppermine River, from the mouth of which he explored the shores of Coronation Gulf to the east, as far as Point Turn Again, a distance of over 550 miles.

In his second overland expedition, he and Dr. Richardson divided their forces at Point Separation, he himself going down one of the eastern mouths of the McKenzie river delta and exploring within 160 miles of Point Barrow, the cape which Beechy reached in 1826 coming through Behring Strait. Richardson explored the coasts between McKenzie River and Coppermine River. As he stood upon a cape on the south shore of Dolphin and Union Strait (named after his two boats) Richardson saw to the north a great land and named it Wollaston Land "after the most distinguished philosopher, Dr. Hyde Wollaston."*

*Most of Wollaston's papers deal more or less directly with chemistry, but they diverge beyond that science on all sides into optics, physiology, botany, acoustics, astronomy, and even touch on art. He discovered the metals palladium and rhodium. The Royal Society awarded him a Royal Medal for his process of manufacturing platinum—a work, which, in its immediate effects, it is almost impossible to over-estimate since it made platinum crucibles generally available, thus supplying analytical chemistry with the most powerful instrument of advance.—Ency. Brit.

It was on his return from this expedition that Franklin visited Ottawa, and on Col. By's invitation, laid well and truly the Foundation Stone of the first lock of the Rideau Canal between Parliament Hill and Nepean Point.

In 1837-8-9, Dease and Simpson completed the examination of the coast, connecting Franklin's furthest west with Beechy's Point Barrow, and Franklin's and Richardson's furthest east with the Isthmus of the Peninsula of Boothia, establishing for the first time, beyond question, that there is a water passage all the way from Behring Strait to Boothia. Dr. Rae made a land journey in 1846 and 1847 and connected Dease and Simpson's work with the work of Parry.*

A year or two before Rae, with his companions, in the accomplishment of this work, wintered in Repulse Bay without fuel, subsisting for twelve months by hook, gun and spear, tramping on foot for 700 miles, and making the first long sledge journey of nearly 1,300 miles made in that part of our district of Franklin; Franklin himself had left England (1845) with the "Erebus" and the "Terror" on that memorable "westerly sailing" from which he never returned—neither he nor his seven score of companions, nor their vessels.

When he had been gone for three years and no tidings of him had been wafted by favouring breezes to waiting, expectant England, great anxiety began to be felt there. In 1848, Sir James Ross was sent to search for the missing expedition. He went to Lancaster Sound and wintered near north Devon, making in the spring of 1849 a long sledge journey with Lieut. McClintock for his companion. Being unsuccessful he returned to England with the sad news. All England was aroused. More than 130 British seamen were lost and their fate must be as-

*In 1853-4 Rae, by a sledge journey of over 1,000 miles, connected the work of Dease and Simpson with that of Ross.

certained, if possible. England has never spared men or money when her subjects are imprisoned and need to be set free whether they are held in bondage among the mountains of Abyssinia or in the "thrilling regions of thick ribbed ice."

In all, I have counted 22 expeditions which were sent to Polar regions to assure their countrymen that all was being done that skill and energy could do to lift the veil and reveal the fate of the captain and men of the "Erebus" and the "Terror." By these, during the years 1850-54, nearly the whole of the vast Archipelago of the district of Franklin was thoroughly searched.

The kindred nation to the south of us generously lent a helping hand, Moses Grinnell, of New York, equipping two expeditions, one in 1850 and the other in 1853, to aid in the search. In commemoration of his efforts we have added to the large stock of place-names Grinnell Land and Grinnell Island to mark our gratitude and to remind future generations of the large-hearted man who acted on the adage "blood is thicker than water" that has more than once been invoked between the two nations in times of need.

France, the other kindred nation of Canada's people, was represented in the search by Lieut. Bellot of the French navy, who went as a volunteer with Capt. Kennedy. The gallant Frenchman was drowned, and his deeds are commemorated by the place name, Bellot Strait, which he discovered, and thus established the most northerly coast of the continent ; and by a marble tablet affixed to a cenotaph erected in Wellington Channel near the place where he lost his life.

Collinson and McClure went by way of Behring's Strait. Penny and Austin entered Barrow Strait from the east. Sir John Ross, then a veteran of 73 years, wintered near Penny, off the south coast of Cornwallis Island. Years before he had promised Sir John Franklin that if the occasion arose he would go in search of him, and now the time for the fulfilment of the promise having fully come, the brave old man, scorning ease when his comrade's fate was the problem to be solved, was at his post amidst the rocks and ice of Franklin District. Kennedy with Bellot was sent out by Lady Franklin herself.

Sir John Richardson* and Dr. Rae, at the instance of the Hudson Bay Co., searched in 1848 the continental shores over Richardson's old route between the McKenzie and Coppermine Rivers, and later on Dr. Rae examined the shores of Victoria Land.

The earnestness with which the search was prosecuted is seen in the fact that on Christmas Day, 1851, eight vessels were in different parts of the District of Franklin frozen up. Some 400 brave men under the ablest arctic explorers were passing the time of darkness as best they could, patiently waiting for the sun's return so that they could scour the islands by means of sledge parties. The plan of campaign was carefully prepared and closely studied during the 120 days of the sun's absence. When the time came, the sledge expeditions were despatched and the work of searching systematically pursued during the next three or four years. Some marvellous journeys were made by these expeditions that were throwing search-lights over numberless bays and inlets, ever hoping to discover some cairn erected, some *cache* made by Franklin, some recognizable fragments of the "Erebus" and the "Terror" cast ashore along the deeply indented coasts. McClintock was away from his ship for 105 days, during which he covered 1,328 miles. During 94 days Mecham travelled 1,163 miles. Sherard Osborn made 935 miles in 97 days. In a second expedition Mecham made a record journey of 1,336 miles during 70 days' absence.

These efforts resulted in the addition of many islands to the Queen's possessions in the far north and were not altogether fruitless in regard to the main purpose. Traces of the missing ships had been discovered as early as August, 1850, by Penny and Ommanney, from which it was ascertained that Franklin, with 154 officers and men, had spent his first winter (1845-6) on Beechey Island at the south eastern end of Wellington Channel, remaining there at least as late as April 1846.

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*In a letter to his fiancee, Prof. Hurley writes (Nov. 7th, 1851):

"To-day I had the great pleasure of meeting my old friend, Sir John Richardson, (to whom I was mainly indebted for my appointment in the "Rattlesnake"). Since I left England he has married a third wife and has taken a hand in joining in the search for Sir John Franklin, (which was the more dreadful?) like an old hero as he is, but not a feature of him is altered, and he is as gray, as really kind and as seemingly abrupt and grim as ever he was. Such a fine old Polar bear." Richardson was 62 years of age when he set out on this overland expedition.

After that, years had to pass before further information was obtained, though Belcher had gone through Wellington Channel and examined the Victorian Archipelago, discovered North Cornwall, North York and North Kent, and connected them by Belcher Channel with Jones Sound and Baffin Bay ; though Kellett and Vesey Hamilton had found their way to the North shores of Prince Patrick Island, threading with swift movement, but with ever watchful eyes, the mazes of the furthest North West of Franklin District ; though McClure had penetrated Prince of Wales Strait, and from his wintering place of Princess Royal Island had despatched sledging parties north and south and east into Prince Albert and Victoria Land ; though Collinson had carried his vessel into Victoria Strait and had come to within a few miles of the spot where Franklin's vessel had been abandoned 5 years before.

In 1854 Dr. Rae, then conducting an expedition for the Hudson Bay Co., learned from a band of Eskimos that about four years before some 40 white men had been seen dragging a boat over the ice near the north shore of King William Island. From these "Huskies" he obtained various articles, which he carried to England in 1855 and obtained the reward of £10,000 offered by the Admiralty to the first one ascertaining the fate of the Franklin expedition.

Lady Franklin in 1857 sent out the "Fox," Capt. McClintock, for further search. He was beset in the middle pack of the Greenland coast, and was held fast bound for 242 days and carried nearly 1,402 statute miles. The ice pack was broken up by a fierce storm on 24th April, 1858, and the "Fox" steamed out from among the rolling masses of ice, escaping from thraldom in a most miraculous manner. After eight months of aimless, helpless drifting hither and thither, McClintock found himself clear of his floating prison and ready to make a beginning in the task Lady Franklin had set him. During the autumn of 1858 he arrived at Beechey Island, and there erected to the memory of Sir John Franklin and his companions, the marble tablet already mentioned as having been provided for the purpose by Lady Franklin. Then he turned his vessel southward into Prince Regent Inlet and wintered in Bellot Strait. By the middle of February, 1859, he was able to start on his first

sledging expedition, the thermometer 48 degrees below zero. As a result he obtained clews from the Eskimo, which led him to return to his ship and to despatch three expeditions, by which evidence, abundant and conclusive, was secured on King William Land, establishing beyond doubt the fate of the "Erebus" and the "Terror." Lieut Hobson, in command of one of these parties, found in a cairn on Point Victory, where John Ross had been on 30th May, 1830, on the north east point of King William Land, a record which read :

"April 28th, 1848, H. M. Ships "Terror" and "Erebus" were deserted on the 22nd. April (1848), five leagues N.N.W. of this, having been beset (by ice) since 12th Sept. 1846. The officers and crew consisting of 105 souls landed here in latitude 69° 37′ 42″, longitude 98° 41′ west. Sir John Franklin died on the 11th June, 1847, and the total loss has been to this date 9 officers and 15 men."

The hand-writing was that of Capt. Fitzjames, to whose signature was appended that of Capt. Crozier, who added, "start to-morrow (29th April, 1848) for Back's Fish River."

From all that can be gathered one of Franklin's vessels must have been crushed in the ice and the other stranded and carried off, bit by bit, by the Eskimo.

The point Sir John Franklin had reached brought him a comparatively short distance from the point he had reached in 1821. He had all but traversed by water the distance between Baffin Bay and Franklin's Turn Again Reef, 160 miles west of McKenzie River.

To Franklin it was plain sailing after he reached (had fate so willed it) the southern extremity of King William Island. Dease and Simpson's, Dr. Richardson's and his own explorations had proved that the water-way between the main land and Victoria and Wollaston lands was navigable in the season. He could have traversed it as easily as Collinson did a few years later. He stood on the verge of the promised land. He saw it but the reward went to others.

What became of the survivors?

There were 105 persons who looked out upon the ice-packed strait on that 29th April, and saw for the last time the ship which had sheltered them for many months.

They had no doubt consulted with Franklin, and had settled what was to be done in the event of having to abandon their vessels. We know that they were on King William Island and that their destination was the Great Fish River. For the rest there is little positive known. McClintock found proof that some of them had perished along the shores of King William Island. Other evidences indicate that the main body of them had succeeded in reaching Montreal Island in the estuary of the Great Fish River.

In 1879 Lieut. Schwatka of the United States Army undertook to find out definitely. He and three companions landed at Chesterfield Inlet and proceeded overland from the mouth of the Great Fish River and thence to Cape Herschell on King William Island, whence he examined the west coast of the island to its northernmost cape. Some graves were found and a medal belonging to Lieut. Irving of the Terror, with bones which were believed to be the remains of Irving. These latter were sent to Edinburgh and re-interred there in January, 1881.

One body had been found in a boat by Lieut. Hobson, and some graves were discovered at different times on King William Island. Indications of boat building were observed at Montreal Island, showing that some members of the ill-fated expedition had arrived at that point. It is all mere conjecture from that stage. The only fact is that though more than fifty years have passed since the noble 100 stood upon Point Victory with their faces turned southward, nothing definite has been revcaled. No skeletons have been discovered. No cairns have been found. A few traditions have been gathered from the Eskimo to the effect that white men were seen toiling along and dying in their tracks, apparently of starvation. Possibly some traveller may by accident find the gnawed bones of the men who left Montreal Island on their weary march inland. It was fifty years before the fate of the men on Marble Island was made known to the world, and the chances of discovery in that case were much greater than in the case of the Franklin men.

The result of the several expeditions of the Franklin Relief Expeditions was the exploration of a vast extent of before un-

known country and the tracing of about 25,000 miles of coast line. The various relief expeditions explored as follows :

Sir John Ross in 1849	990 miles
Capt. Austin	6,087 "
Belcher and Kellett	9,432 "
McClure	2,350 "
Collinson	1,030 "
McClintock, 1857	800 "
	20,689

Much of this had been partially explored by previous navigators, but about 7,000 miles of previously unexplored coast were added by the Franklin Reliefs. In the above statement the miles of coast explored by American navigators and by Lady Franklin's parties (except McClintock's) are not included, nor are the explorations of Dr. Rae.

When McClintock withdrew his ship from the mazes of the District of Franklin, the exploration of the District had been nearly accomplished.

After that England lost interest in Arctic exploration, and for fifteen years the British Government did nothing for the advancement of geographical research in north Polar regions, leaving that kind of work to English yachtsmen, to Austrians, Germans, Swedes, Norwegians, and Unistoniams, the latter confining themselves chiefly to our side of the pole ; the others giving their attention to the Siberian side.

On the map far to the north, you will see Ellesmere Land, Schley Land, Arthur Land, Grinnell Land, Garfield Coast and Grant Land, separated from Greenland by Smith Sound, Kennedy Channel, Robeson Channel and Lincoln Sea. Ellesmere Land and Smith Sound were named by Baffin in 1615. Then till 1853 no white man is known to have explored the region. In that year, nearly 240 years after Baffin's voyage, Dr. Kane, (U. S.), explored the Sound and went through Kane Basin into Kennedy Canal. He was followed by Dr. Hayes of the United States in 1860, who reached 81° 35'. Capt. Hall (1871-2) received assistance from Mr. Robeson, Secretary of the U. S. Naval Department, and passed through and named

Robeson Channel, the northern continuation of Kennedy, reaching 82° 16'. By these, and other Unistoniam explorers, the northern extensions of Baffin's Ellesmere Land and Smith Channel were explored and named, and thus it is that in the north-east corner of the District of Franklin, we have a curious combination of place names, commemorative of British and American worthies, suggestive of that closer association of recent times which seems to prognosticate the union of the several branches of the English-speaking people, after a few more presidential elections have eliminated the amusing tendency to "tail-twisting" our breezy neighbours periodically display, owing, apparently, to a deep seated provincialism not yet eradicated.

I have mentioned that the District of Franklin has had its free schools, its free theatres and its free newspapers, and also its own currency (gun wads). It has also inspired great painters. "The North West Passage" exhibited at the Academy in the Spring of 1874, was perhaps, the most popular of all Sir John Millais' paintings at the time, not only for its intrinsic merit, but as an expression, more eloquent than words, of the wide felt desire that to England should fall the honour of laying bare the hidden mystery of Canada's North. "It might be done and England ought to do it." This was the stirring legend which marked the subject of the painting.

Capt. Trelawney, who in his younger days had been an intimate friend of Byron and Shelley, sat for the "old sea-dog," whose weather-beaten features gave utterance to the sentiment nearest his heart. By his side is outspread a map of the Northern regions, and with her hand resting on his hand, his daughter rests at his feet, reading to him the records of previous attempts to reach the North Pole.

This picture powerfully assisted men like Sherard Osborn and others, who had been connected with circumpolar exploration during the "fifties," in their efforts to induce the Government to try again. After 15 years of inaction, in the autumn of 1874, the Prime minister, Benjamin Disraeli—that bright and morning star of the Imperialistic principle, whose steady light has guided the British people to Imperial unity—announced the

intention of the Government to send an expedition in 1875. The ships equipped for the purpose were the screw steamer the "Albert" and the "Discovery," under the command of Capt. Nares, whose experience had been gained in the "Resolute," Captain Kellett, in 1852-4. With him were Commander Markham, Captain Stephenson (commander of the "Discovery") Lieuts. Aldrich, Parr and Beaumont, and Capt. Fielden. Capt. Nares encountered great difficulties, but he pushed his ships up Smith, Kennedy and Robeson Channels, and wintered in the "Alert" in 82° 27′ north latitude, the highest point of wintering ever attempted to that date, the "Discovery" being some miles to the south. In the spring of 1876, the explorers made several extended sledge journeys under Commander Markham and Lieuts. Aldrich and Beaumont. Aldrich explored 200 miles of the north and west coast of Grant Land, going as far as Cape Alfred Ernest (named after the Queen's second son). Markham and Parr boldly pushed out straight for the North Pole, and reached the highest point up to that time attained, viz., 83° 20′ 26″ N., or 38° north of Ottawa, say about the distance between Halifax and Glasgow.

You will see the names of many of these navigators on the chart of the most northerly regions of Canada—Nares Land, Markham Island, Aldrich Bay, Beaumont Island, etc.

We can trace here and there in the older provinces of the Dominion the influence of these Arctic explorations upon the thought of the people.

In Ontario we have Parry Sound and Island named by Commander Bayfield, R. N., who made a survey of Lake Huron and Georgian Bay (1822-25.) and named the Sound after Parry, the fame of whose exploits as an Arctic Navigator in 1819-20 had naturally attracted Bayfield.

McClure township in Hastings County was named in 1857 after Sir Robert LeMesurier* McClure, R. N., the Arctic explorer. McClintock township in Muskoka perpetuates the fame of Sir Leopold McClintock, whose name also appears in many

*In his most interesting book "Nothing but Names," Mr. Gardiner gives the name as Robert J. McClure. This is a mistake.

places on the map of our Arctic regions. There are several Franklin's in the Provinces, for Franklin's fate was discussed around many a fireside in British North America in the "fifties."

It may be asked by an utilitarian age *cui bono*? What is the good of this District of Franklin? Let it pass away from our memories. It is a deserted mausoleum, strewed with the graves of heroes, if you will, but is there any money in it? I answer (1). Half a dozen years ago people said, "Canada is the land of waterfalls, but what is the good of them. They are in out of the way places. What is the good of having seven millions of horse power in falls and chutes when they cannot be utilized?" A German student in the quiet of his laboratory discovered that spruce made the best pulp for paper. To-day, after wasting their strength for centuries to no practical purpose, except here and there driving a saw mill, the waterfalls of Canada are in great demand for pulp-making purposes, and there is scarcely a fall in all the broad land but has been bought up or is the subject of an option for purchase.

I answer, (2) Look at Yukon territory. A few years ago when we took the census of 1891, we did not think it worth while to send an enumerator into any part of the vast territory known as Yukon. We simply delegated the Hudson Bay Company's people at Fort Liard to keep count of the Indians from the regions watered by the Upper Liard, the Pelly and the Yukon rivers, who came to the Fort for the purpose of trading. Now in nine years' time there are, I am informed, 15,000 or 20,000 persons grubbing for gold along the rivers, streams and creeks of that great district. Banks, churches, schoolhouses, gambling dens and homes abound, and we will have to organize as complete a staff for census purposes for Yukon as for Prince Edward Island. Who knows what the future has in store for the district of Franklin? We know that the musk ox abounds, for McClure's men in the term of their captivity in Bay of God's Mercy shot 112 of the great shaggy animals on Banks Land, while further north on Melville Island the musk ox finds a congenial habitat, and still further north Peary shot the shaggy bovine for his Christmas dinner. Deer abound. Wolves are

numerous. Fish are in plenty. The Eskimo designate it "the land of the white bear."

Anthracite coal has been found in different parts of the District. Pure copper in large masses was found in the possession of the Eskimo of the Island. Vast petrified forests, capable of being utilized for the adornment of the homes of civilization have been found. Sir Edward Belcher tells of thermal springs and of gold found in North Cornwall. Indications of mineral oil are mentioned by some explorers. It was because of applications for gold areas in Southampton Island that Hon. D. Mills considered that a special transfer of the Island should be made to Canada.* Even those most steeped in utilitarianism will admit that there are possibilities to excite their jaded powers in these but partially explored regions.

I have left to the imaginations of my hearers the trials and dangers, the exciting events experienced by these Arctic explorers in thus discovering the boundaries of the District of Franklin. From many instances I take but two or three as specimens.

Captain Lyon sailed from England in the "Griper" in midsummer, 1825. In August he made the high land of Southampton Island, and rounding its southern extreme stood up the "Welcome." As they advanced northward their compasses became useless. A heavy sea swept incessantly the crowded decks and a thick fog like a pall covered everything. Three bower anchors and a stream anchor were let go, but before the vessel was brought up by these the water had shoaled to five fathoms and a half. Momentarily expecting that the ebbing of the tide would cause the vessel's destruction, they prepared the boats, and every officer and man drew his lot with the greatest composure although two of the smaller boats would have been swamped the instant they touched the seething waters. Hour

*I have merely indicated the more material of the utilities connected with the Arctic possessions of Canada. I have not attempted to point out the advantages to the world at large to be gained by polar exploration, associated as it is with a true understanding of geology, meteorology, terrestrial magnetism, and of those departments of science which deal with the flora and fauna of the globe and need the elucidations that are supplied by knowledge of the plant and animal life of the polar regions.

after hour the decks were flooded, drenching the poor fellows to the skin. The weather clearing a little, a low sandy beach was seen just astern on which the seas were breaking fearfully. Had the anchors parted no human power could have saved them.

Although few of the men had any idea they could ever survive the gale, Lyon ordered that every man should put on his warmest clothing and secure some useful instrument about his person.

"Each, therefore, brought his bag on deck and dressed himself and in the fine athletic forms which stood exposed before me," says the narrator, "I did not see one muscle quiver nor notice the slightest sign of alarm. Prayers were read and then all sat down in groups, sheltered from the wash of the sea by whatever they could find and some endeavored to obtain a little sleep."

"Never," says their gallant commander, who had not been in bed himself for three nights, "never, perhaps, was witnessed a finer scene than on the deck of my little ship when all hope of life had left us. Noble as the character of the British sailor is always allowed to be in cases of danger yet I did not believe it to be possible that among 41 persons not one repining word should have been uttered. Each was at peace with his neighbour and all the world and I am firmly persuaded that the resignation which was then shown to the will of the Almighty was the means of obtaining His mercy. God was merciful to us and the tide fell no lower." Very appropriately was the scene of this affecting narrative named the Bay of God's Mercy.

Another eventful day in the history of the District of Franklin was the 6th of April, 1853. Sixty-six men were on that day in the "Investigator" encased in ice in another Bay of God's Mercy on the north coast of Banks Land. They had not had a full meal for twenty months. They were reduced in strength from the attacks of scurvy. They had just lost by death one of their messmates. The ship's stores had been carefully doled out to them and they were supplementing the dole with arctic mice cutlets and other luxuries. In their extremity they had resolved upon breaking up into parties to set out in their weak emaciated condition, one over the ice to the north-east, another overland to gain the north shore of the main land and thence to journey to

the mouth of the McKenzie River for the nearest Hudson Bay Company's post, while the third party was to remain with the ship. While four men with heavy hearts were digging the grave, a figure was observed approaching on the ice from the northward. The figure proved to be Lieut. Pim of H. M. "Resolute" from Melville Island "who had most providentially reached the "Investigator" after a most severe and harassing journey of 28 days." Dr. Armstrong, who died in July 1899, describes the event: "I cannot attempt, he says, to convey any idea of the scene which took place on board or the expressions of joy and gladness which were so abundantly poured forth when the intelligence that flew with the rapidity of lightning from stem to stern became known. It was at first pronounced either a mistake or a joke. Indeed the mind for the moment appeared confused as if unable to comprehend the truth of what was heard and several strange involuntary questions were hastily muttered, asked and answered in a breath. At length when thoroughly aware of the reality and fully aroused by a shout of joy raised by a few men on deck, announcing the approach of the strangers, there was a sudden and simultaneous rush to the hatchways, the weak and the strong, the maimed, the halt and the blind following each other, amazed and agitated, as fast as their enfeebled limbs could bear them until the deck was gained and they were afforded an opportunity of verifying what they had just heard. Some as doubting the reality of what they saw, rushed out on the ice and were not satisfied till they met Lieut. Pim, touched him, handled him and heard him speak when they no longer doubted. He was the first of our countrymen we had seen or whose voice we had heard for three long and dreary years. The sledge soon followed and the party were received by three as hearty cheers as ever came from the lungs of British sailors. No words could express the feeling of heart-felt gladness which all experienced at this unlooked for, this most providential arrival. Relief was now at hand; succour had reached us."

I have heard from Bedford Pim's own lips the story of the meeting, told with modesty and yet with conscious pride that he had been the instrument of the rescue.

The 25th August, 1854, is a day long to be remembered in the annals of Franklin District. The crews of the "Investiga-

tor,'' who had entered on their fifth year of arctic service, were that day on board the '' North Star '' at Beechey Island. With them were the crews of the '' Resolute,'' the '' Intrepid,'' the '' Assistance,'' and the '' Pioneer,'' all five vessels having been abandoned, all waiting the order of Sir Edward Belcher to cast off from the ice floe on their homeward voyage. The order was given, and just then the faint outlines of two ships were seen through the haze. They proved to be H. M. ships '' Phœnix '' and ''Talbot'' from England, bringing with them letters for many of the crew. The men were at once distributed among the three vessels, which immediately proceeded on their course. We can imagine the joy of the men on that day.

THE HURONS OF LORETTE

The French travellers and missionaries who explored the basin of the St. Lawrence at the beginning of the seventeenth century, found, within that vast area, two distinct races of aborigines :

(1) The Algonquins, nomadic hunters, roving over the lower valley and the northern highlands ;

(2) The Huron-Iroquois, of more sedentary habits, with some development of agriculture, a better defined and more solid organization, settled in the region of the three great lakes Ontario, Erie, Huron.

The Hurons numbered twenty thousand people or more, and their villages covered the land from the shores of Lake Simcoe to those of Georgian Bay. It is from this point, that after its overthrow by the Iroquois, a portion of the Huron nation repaired to Quebec, and finally took root at Lorette,* where they still form a separate group.

Throughout some northern townships of Simcoe County, remains of Huron occupation have been for sixty years past, and are still at the present time being found : ancient village sites are discovered, bone pits are brought to light, fragments of primitive pottery are unearthed.† Meanwhile, at Lorette, the observer is confronted with debris of a very different character : social traditions still persistent and to quite an extent impressing the minds and moulding the lives of French-speaking descendants of the primitive Hurons.

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*On the map attached, the location of Lorette is shown by the sign x.

†A. F. Hunter, Sites of Huron Villages, Appendix to the Report of the Minister of Education, Ontario, 1898, 1899.

The Iroquois were a confederation of five tribes, whose settlements, south of Lake Ontario, extended in an almost straight line from the Genesee River to the sources of the Mohawk and Hudson rivers in the Adirondacks. From a few of these tribes, the Jesuits, subsequent to 1667, gathered the foundation stock of a colony which still exists at Caughnawaga, near Montreal.*

Last summer, guided by the LePlay and de Tourville method of social enquiry, I attempted an investigation into the social conditions of the Hurons of Lorette. I endeavored to ascertain, as fully as the short time at my disposal permitted, the present status of the community, the degree of its variation from the primitive type, and the influences which brought about this variation.

I also visited the Iroquois of Caughnawaga with a view to securing a ready point of comparison.

PHYSICAL FEATURES.

In order to obtain an insight into the social characteristics of any human grouping, it is necessary, first, to investigate its means of living ; and these, in almost every case, will be largely dependent on the natural resources of the locality. Let us then see what are the physical features and resources of the country surrounding Lorette.

The first fact to be noticed is the situation of Lorette at the meeting point of two great regions widely different in the relief and composition of their soil, as well as in their natural capabilities and productions.

On the one hand, to the South, towards the St. Lawrence, a relatively narrow belt of flat, low country, through which the River St. Charles slowly winds it course to its estuary at Quebec. The soil of that champaign region is generally deep, fertile and specially well adapted to agricultural pursuits, as evidenced by the fine expanse of cultivated fields interspersed with comfortable farm houses, cosy villages and glittering church steeples which one may observe from the elevated terrace of Indian Lorette, while in the distance, some ten miles away, loom up the busy suburbs of Quebec, the cape and the citadel.

*On the map, the location of Caughnawaga is shown by the sign ⊙.

On the other hand, to the North, along the upper course of the St. Charles, lies a strip of level but rather poor, sandy soil, and the country then merges into a vast mountainous tract which extends to Hudson Bay and the Atlantic Ocean, interrupted only by the valley of the Saguenay and Lake St. John. That North Laurentian mountainous region presents a succession of rocky, rounded summits, cut by narrow valleys, with sparse, limited areas of shallow soil ; a land well adapted for the production of fine timber, especially for the growth of the coniferæ, and originally an unexcelled thriving ground for the fur-bearing animals, but over the greater part of its extent offering little inducement to agricultural settlers, who only of late years have taken a foothold within its borders.

If we compare the geographical position of our Lorette Hurons with that occupied by their ancestors in the vicinity of Lake Simcoe, during the first half of the seventeenth century, we cannot fail to notice their close similarity. Although separated from East to West by an interval of nearly 400 miles, and though the one is 150 miles (2 degrees) to the South of the other, both points lie alike at the very edge of that same Laurentian formation, betwixt mountain and plain, with a vast natural hunting ground on the one side, and deep soils inviting tillage on the other.

Neither is this to be looked upon as a mere coincidence. Such a position would commend itself to people of the Huron-Iroquois type, relying for their maintenance, on the produce of the chase and, in about equal measure, on that of a rude, primitive agriculture.

If we glance at the map here given, we will observe that while the various groups of that stock had their fixed abodes within the champaign region bordering on the Great Lakes, none was very far distant from mountainous tracts, some of which even up to this day, have remained typical breeding grounds for wild animals. Two instances are particularly striking : (1) Next to the ancient habitat of the Hurons, that sportsman's resort of to-day, the Muskoka and Parry Sound country ; and (2) close to the old Mohawk settlements, the famed Adirondacks, the one and the other resting on the rugged Laurentian formation.

It may be broadly stated that the champaign region is made

up of two varieties of soil : (1) a belt of rich clays, bordering on both shores of the River St. Lawrence ; (2) a belt of poor sands, bordering on the mountain ranges.

The Hurons of Lorette, though still within the flat, or champaign region, are not on its inner, fertile zone, but on its outer sandy zone. At their village, called Indian, or Jeune Lorette, the line of demarcation between the two zones is very apparent. Here the River St. Charles passes through a steep and narrow gorge, to a lower level. From the terrace on which Jeune Lorette stands, if we look down the course of the St. Charles, there appear to us on the dark rich loams, in close succession, the farms of St. Ambroise, Ancienne Lorette, Charlesbourg, Ste. Foye and Beauport. On the contrary, should we turn northward and ascend the course of the St. Charles, farms would no longer be observed on the sandy riverside, but instead an after-growth of spruces, and the summer villas of some professional men of Quebec.

At Caughnawaga, nine miles from Montreal, on the opposite shore of the St. Lawrence, where thrives a community of some 2000 Iroquois, the physical conditions are not at all similar to those amid which the Hurons of Lorette have been made to develop. In fact they are almost the complete reverse.

The champaign region, and, with it, its inner fertile belt of marine clays, on both banks of the St. Lawrence, increase rapidly in width as we proceed from Quebec to Montreal. In a general way these are described by Canadian geologists as covering a triangular area, the apex of which is towards Quebec, while the base runs from Ottawa to the head of Lake Champlain. It will thus be seen that Caughnawaga stands in the centre of a wide plain, is surrounded on all sides by a flat country provided with a rich soil.

It may be added that the mountainous region which bounds the plain to the South-East, is of slight altitude, and underlaid not by very hard granites and schists, like those of the Laurentian formation, but by softer rocks, limestones and slates, of the Cambrian and Silurian series, which by weathering have yielded abundant and generally rich soils. So that wide ranges of this mountainous country are well adapted for farming and at an early date were taken possession of by agricultural settlers.

In fine, while the natural conditions surrounding the Hurons of Lorette may be summed up as follows : nearness of vast mountain and forest tract, limitation of tillable area ; the position of the Iroquois of Caughnawaga, on the contrary, is characterized by the development of the fertile belt and the limitation of the mountain and forest tracts. These two sets of physical conditions have had far reaching effects on the evolution of the communities swayed by them, and, first, on their systems of labour, as we will see presently.

LABOUR.

As the traveller from Quebec reaches by the Quebec and Lake St. John railway, the village of Indian Lorette, the means of living of the inhabitants are vividly revealed to his senses. On the right, he cannot fail to notice an extensive field covered with poles and rails, on which hides in great numbers are hung up to dry. To the left, between the railway track and the River St. Charles, he observes some fifty houses, nearly all alike : small, low-roofed, wooden buildings, whitewashed, in double rows separated by narrow lanes. On small plots adjoining some of these houses, hide-drying scaffolds and hide-dressing apparatus similar to those just noted, only on a smaller scale, are visible. Some houses have very small kitchen gardens attached ; but others are so close together, that not even space sufficient for a flower garden remains.

I visited several of these houses, and found them to be as many workshops, or as many homes of workers performing various tasks and turning out various wares on their own account, or for the benefit of an outside employer who provided the raw material and paid his help wages by the day or piece.

While some of the men were engaged, at Bastien's, or Cloutier's, or Ross' tannery, steeping the green skins in water, and then scraping off the inner (or meat) layer, and the first outer layer (with the hair) ; another class of workmen, on the same grounds, following up the process, washed the skins in soap emulsions, put them up to dry, sprinkled them with codfish oil, sand-papered them, and finally passed them through a smoking house.

Meanwhile, in the workshop connected with each establishment, the boss, or skilled workmen under his supervision, cut out

of the thick, velvety, odorous surface of the dressed skin, the various pieces, bottoms, tops and uppers, required for the manufacture of moccasins.

These several pieces are then distributed among the women, at their homes in the village, some of whom embroider the top pieces with moose hair of various tints, while others undertake the turning up and wrinkling of the bottoms, and others still sew on the uppers.

The moccasins are then returned to the workshop of the employer, where with the aid of a few simple machines, holes are punched through the uppers, eyelets and hooks fastened on. Laces are made from strips of the hides, and the moccasins packed and shipped to distant points.

At other times, we might find the men in large numbers busy making snowshoes, bending into shape the slender wooden frames and weaving in the strings. Again, occasionally, we might be attracted by the sight of a newly-made, freshly painted, canvas canoe, drying in the sun on the verandah of some cottage.

I had not been long in the village of Lorette, before three or four dark-eyed children ran up to me and offered various small wares. Bright little girls were they, not easily fooled and quick at sales. I was taken by them to their parents' homes, and there viewed displays of ornamental baskets, canoes, fans, etc. Men were leisurely preparing strips of ash and discs of various woods, which the women and grown-up girls use in the making of the baskets and fancy wares.

While gazing upon the display of wares at the house of Prudent Tsioui, I made the acquaintance of another Huron, who was working for him, Daniel Gros-Louis. The latter, does not manufacture on his own account, but works by the day at the various industries carried on in the village ; and his principal vocation is accompanying, as guide, city sportsmen on their annual outing in the woods. That evening I hired Gros-Louis to take me a few miles up the St. Charles, and as we glided slowly, in the dusk, over the dark waters of the picturesque forest-fringed stream, he told me in language at times forceful, of the woes of the poor Indians, despoiled of their hunting grounds by the encroachments of the white settlers and the leases

to clubs. Gros-Louis stated clearly that in his opinion there are only two decent kind of people: first, the Indians, like himself of course, then the "gentlemen," who occasionally help the Indian on. As for the "habitants," they are a stupid lot, who work hard and ignore the pleasures of life.

The Huron villagers do not seek any appreciable part of their income from agriculture, nor even from those more simple opportunities offered by country life. Only three or four families keep cows (one each), and a few hens. The others purchase from French farmers the very milk and eggs they consume. Only one keeps horses.

However, being informed that on a reserve 1600 arpents in extent, two miles distant from the village, a few Hurons were settled on farms, I started out, one morning, on my bicycle, rode through the village of St. Ambroise (adjoining Indian Lorette), down to the lower plain, along a range of good French Canadian homesteads, and soon coming once more upon a stretch of sandy uplands, was apprised that I had reached the Indian reserve.

The six or seven Huron families settled here (though they may occasionally turn out a few pair of snowshoes) do not resort to industry in at all the same measure as do the Lorette villagers. They are supposed to depend principally on farming, but can hardly be considered farmers. Much the greater part of the Reserve is still bush. Each farm comprises only a few arpents (at most ten or twelve) of cleared land, on which, at the time of my visit, the only growth to be observed, apart from a small garden and potato patch, was a miserable field of very thin hay, overrun by oxeye daisy. In rare instances, a crop of a few bushels of oats might be added. When farm animals were kept at all, the stock consisted of one cow (exceptionally two), one horse (if any), one or two porkers and a few hens. Attracted to one of these homesteads by the rather better appearance of the house and barn, compared with the hovels on most of the other clearings, I was disappointed to find that the husbandry there carried on was of the same undeveloped, primitive type. I did not see any stock, but was met by the fierce barking of three or four dogs coming out in succession from under the door steps. "They are very good hunting dogs," the people told me by way of apology.

For the Hurons of the Reserve, a more important, and certainly more congenial means of living than agriculture, is hunting. Beaver, otter, marten, mink, cariboo, are still in fairly large numbers over the vast unsettled track which extends towards Lake St. John ; but moose, the most valuable for manufacturing purposes, is scarce now.

Just as Gros-Louis had done the evening previous, the Tsiouis of the Reserve bitterly complained of interference with their hunting privileges on the part of the whites, through governmental regulations and leases to clubs. Forest rangers were on the look-out, and frequently confiscated the pelts and destroyed the traps of the poor Indians.

The resources derived from their farms and their hunting expeditions are inadequate for the support of these Hurons, and they would be in utter misery, were it not for some additional revenue obtained in various ways : drawing firewood from the reserve to the Lorette villagers, day labour performed on the railway and elsewhere in the vicinity, and oftentimes, the very material help provided by their women folk. The occupant of the first house I entered on the Reserve, was an old man supported partly by a son living with him but working for a baker at St. Ambroise ; and partly by a daughter, who kept his house and did some sewing for outsiders.

Now and then a Huron will leave the village or the Reserve and spend a few years in the United States, employed as common laborer, when he will return to his former home.

To sum up the labour system of Lorette : Hunting is today of little account, except for very few of the Hurons ; but a number of the men hire out periodically as guides to parties of sport seekers from the cities. Farming is not carried on to any appreciable extent. The only important means of living are manufacturing industries, such as the making of baskets and of various fancy wares, the making of canoes and of snowshoes, and above all, the making of moccasins and the dressing of hides therefor. It is to be observed that the hides used in the manufacture of moccasins are for the greater part imported : East India elk and antelope. Of the skins the produce of the region, moose has become scarce, cariboo is suitable only for mittens, gloves and the

uppers of moccasins ; cow, for snowshoes. Neither is fine birch bark commonly found within reasonable distance, and canoes (of which about 25 are sold yearly) are mostly made of canvas purchased at Quebec. Ash wood for basket-making is also obtained from distant points.

On the other hand, moccasins and snowshoes are sold by the wholesale to dealers in large towns and cities throughout Canada and in the United States. They are shipped as far as the Klondike. As for baskets and fancy wares, part of the output is disposed of in the same way, the bulk of what remains being taken by the Hurons themselves to summer resorts and centres of population, and there retailed.

The means of living of our modern Hurons as just described, do not at first sight appear to have any connection either with the previous social status of the race, or with the physical features of its present habitat.

With the ancient Hurons, as with the ancient Iroquois, hunting (carried on by the men), agriculture (carried on by the women), were the principal means of subsistence ; to-day at Lorette, both these forms of labour have been almost given up. In their stead manufacturing industries have grown and come into prominence, industries, however, which do not depend for their raw material on the resources of the locality, and which find in the vicinity a market for a very small portion only of their output.

Two main series of facts brought the Hurons by degrees to give up their old forms of labour and adopt new ones :

(1) The neighbourhood and competition of settlers from Europe ;

(2) The commercial and industrial evolution.

In the first place, the neighbourhood and competition of white settlers in the vicinity of Quebec had the effect of rendering agriculture more difficult and less remunerative for the Hurons.

The agriculture of the Hurons, as we are aware, was of a primitive kind. It consisted solely in the production through female labour of supplies of vegetables and maize for family needs. No live stock, no beasts of burden were kept. So that, being without the means of manuring the land or drawing fuel

long distances, they were obliged to change their location as soon as the fertility of the soil and the supply of firewood within a limited radius, were exhausted.

In the old Huron country the change of abode, according to Champlain, took place every ten, twenty or thirty years. The same practice was followed by the Huron refugees in the vicinity of Quebec. But here, while the Indians were always free to desert their village site and seek a new one farther in the interior, they were no longer at liberty to retrace their steps. The crowding in of the Habitants around them prevented their moving in any but one direction. From Sillery, the Island of Orleans and Beauport they receded to Ste. Foye (1667), from Ste. Foye to a spot known at present as Ancienne Lorette (1674), and finally from Ancienne Lorette to Jeune Lorette (1697), where they are to-day. Thus were they evicted from the fertile belt of rich lowlands to the sandy terrace bordering the mountain tract. The new conditions were not favorable from the outset to the development in these primitive men of a stronger disposition for agriculture.

As a second result of the neighbourhood and competition of the white settlers about Quebec, the chase also was hampered and curtailed, wild animals receding and becoming scarcer all the time as the settlements extended further back. This second result, however, was effected at a much later date than the first, and not so thoroughly. Not before the close of the eighteenth century or the opening of the nineteenth, do the Hurons of Lorette show signs of discomfort on account of scarcity of game.

Coincidently, a third result was brought about: the development of the traditional home industries of the Hurons, consequent on the decrease of both agriculture and the chase. To make up for the deficiency in the returns from their farm plots and hunting expeditions, they now took to turning out for the trade the various wares which heretofore they had manufactured solely for their family needs. The greater value thereby given to the skins, made up in part for their greater scarcity.

The changes in the labour system of the Hurons of Lorette, thus induced by the neighbourhood and competition of the French settlers, have, of recent years, been greatly intensified by a very powerful factor: the evolution of commerce and industry.

The latter half of this century, and particularly the last twenty-five years, witnessed the rise and spreading throughout Canada of the world-wide commercial and industrial evolution, that is, the introduction of machinery, the building of railroads and canals, the extension of great transportation agencies. Man's powers of production and distribution have thereby been increased a hundred-fold. Distance has been suppressed, so to speak ; and each locality is now afforded the opportunity to develop and pursue on a large scale those industries for which it is best adapted by its natural resources or its social conditions.

The commercial and industrial evolution was the death-blow to some of the minor industries of Lorette, but into others it instilled a new life. Competition put a stop to the manufacture of toboggans and of lacrosses ; but a new industry, fancy basket-making, taken from the Montagnais and the Abenakis, some ten or fifteen years ago, was introduced ; and considerable impetus was given to the making of snowshoes and moccasins and to the dressing of hides. On an average, 10 to 15,000 hides are cut annually at Lorette. In 1898, 140,000 pairs of moccasins were made, and about 7,000 pairs of snowshoes. Instead of the very small family workshop of old, we now see vaster collective workshops run by outside employers of some means.

Not only do the Huron villagers depend for their support almost entirely on the revenue derived from the various manufacturing industries ; but a number quite as large of French Canadians settled in the village of St. Ambroise close by, look to the same pursuits for a living. Snowshoe making is the only industry of the Indians which the Hurons have kept to themselves, not more than two French Canadians being trained in the art.

In turn, this very development of the manufacturing industries reacted on the old forms of labour and caused their further decline. Henceforth, assured of constant employment at easy work, the Hurons gave up almost entirely agriculture, which had long been neglected, and even the chase, which had been dwindling away of late years.

Despite the evolution of their labour system, and notwithstanding a few individual cases of transformation, the Hurons of Lorette as a whole still exhibit traits retained from their primitive social status. For instance, the men, generally speaking,

are not as industrious as the women. They still entertain a dislike for agriculture and steady work. I inquired whether the Huron villagers sought employment at Reid's paper mill near-by. I was told they did not, the reason being principally that "Indians dislike working in factories"; they prefer working at home, or in collective workshops, paid by the piece, and left free to interrupt their work at their fancy.

The forms of labour resorted to by the Iroquois of Caughnawaga, are very different from those in use by the Hurons of Lorette. While the latter community, as we have seen, gets its living almost entirely through the prosecution of a few traditional manufactures which the industrial and commercial evolution has revived, and in which both men and women participate; at Caughnawaga, the men are engaged principally in agriculture, lumbering, quarrying and heavy day labour. It is only of recent years that an industry comparable with that of the Hurons has been introduced: beadwork, carried on by women with material imported from Venice. Lacrosses and snowshoes are also made, but not extensively. The Iroquois of Caughnawaga have the reputation to-day of being hard and steady workers, which the men of Lorette, generally, have not.

This contrast is the more striking in that originally the Iroquois—apart from a slightly superior development of agriculture and a correspondingly inferior development of the chase—possessed a labour system very similar to that of the Hurons, and were broadly speaking of the same social type.

The explanation, to my mind, lies mainly in the diversity of their physical environment for the last two hundred years. See the Hurons, settled at a point of the valley where the arable plain is very narrow, close to a vast mountain and forest tract; the first effect of the advent of the French was to evict the Indians from the fertile belt, to drive them by degrees to the sandy terrace and rugged wilderness at the back, to turn them more completely towards the chase and the industries dependent for their raw material on the chase and the forest; until the day came when the evolution of commerce and industry enabled them to carry on these trades independently of local resources.

On the other hand, see the Iroquois of Caughnawaga, in the centre of a wide plain tillable over its whole extent, far from any

extensive mountain or forest area : the advent of the white settler had not the effect of depriving these Iroquois of arable land (abundant in the vicinity), but it had the effect of cutting them off from their hunting grounds (inextensive and far distant) at the back. Caughnawaga was at an early date encircled by a belt of farm settlements which isolated it from all mountain tracts and restricted the run of the Iroquois. The latter were thus at the outset forced out of the chase, and, at the same time, out of those industries dependent on the chase and the forest. When, many years later, the progress of mechanical arts and transportation agencies made it practicable to carry on manufacturing by means of raw material imported from distant lands, the very tradition of the most important industries (save bead work) no longer subsisted among the Iroquois. Meanwhile the men had been constrained to find other means of living ; they had taken to agriculture.

The social observer who visits Caughnawaga is deeply impressed at seeing still attached to almost every home in that extensive village, a plot on which are grown the very crops described by Champlain, Brébeuf and the early explorers as characteristic of the old Huron-Iroquois agriculture : Indian corn, or maize, pumpkins, beans, tobacco and sunflowers, to which potatoes are added.

About one fourth of the population of Caughnawaga, say 100 families, depend mainly on agriculture for a living. Several of these have under cultivation 100 arpents ; some thirty families work as much as 200 or 300 arpents.

These modern Iroquois, as is here seen, are very different from the primitive type, with whom agriculture did not develop beyond mere garden work carried on by the women folk.

Primitive communities, accustomed to support themselves through forms of labour which consist in the mere gathering of natural products (through hunting for instance), do not willingly give these up for the more arduous pursuits of agriculture. Some sort of constraint is necessary to bring about the change. In the case of the Iroquois of Caughnawaga, it was the deprivation of their hunting grounds which made agriculture a necessity. At the same time, the depth and general fertility of

the soil of the champaign region, no doubt facilitated their passage from the chase to agriculture.

The physical features of Caughnawaga favoured the development of still other means of living among our Iroquois. The nearness of the River St. Lawrence and of the Lachine rapids enabled them to preserve their old-time expertness in paddling bark canoes through narrow, precipitous, river channels. That, in turn, led them to take employment as carriers for the fur trade companies, at the beginning of this nineteenth century and later on, when the lumber trade set in, to become drivers of rafts and to engage in the lumber camps.

Then again, the outcrops of good building stone on their reserve and the construction, in the vicinity, of railways and bridges, afforded them opportunities for earning good wages at heavy work, and broke them into steady labour. At present about 100 Iroquois get regular employment at various tasks on the works of the Dominion Bridge Company, at Lachine.

While thus acquiring to a great extent the white workingman's ability for heavy labour, the Iroquois of Caughnawaga appear to have lost some of their old aptness for protacted running and marching. Not many years ago after taking a crib down the Lachine rapids and leaving it at the "foot of the current," opposite Montreal, a party of fifteen or sixteen Iroquois would walk back to their village, some nine or ten miles away. Nowadays they wait for the next train. Much the greater part of their travelling is done by rail.

In short, while the conditions of physical and social environment at Lorette both tended to keep the Huron away from agriculture, enabling him up to quite recent times to support himself by hunting, kindred forms of mere gathering labour and small manufacturing industries dependent on these; at Caughnawaga, owing to a very different physical environment, the Iroquois was forced to change, to give up the chase, to break himself into farming and like forms of heavy extractive labour.

To-day, if we consider only the forms of labour by which they support themselves and their fitness for steady work, the Iroquois have come nearer to us, have remained less primitive, less savage, than the Hurons.

PROPERTY.

In all communities, there is a close relationship between the forms of labour resorted to and the system of property. Thus, primitive races which get their living by the gathering of natural productions (hunting, collecting, etc.,) do not recognize individual ownership of land, which, on the contrary, becomes a basic principle of societies sustaining themselves by extractive forms of labour, and notably, by agriculture.

The ancient Hurons had but a rude, undeveloped, practice of agriculture, and correspondingly their hold on the soil was of a precarious, limited, sort. Their frequent changes of abode are good proof of that. After their removal to the vicinity of Quebec, they did not,as we know,take more energetically to the cultivation of the soil ; on the contrary, under the new conditions, they gave up little by little the practice of agriculture. Similarly they did not develop any greater ability to hold land either privately or collectively.

In the year 1651, the king of France had bestowed on the Christian Indians settled in the vicinity of Quebec (of which the Hurons were the nucleus), a grant of land covering three miles in width on the River St. Lawrence by 12 miles in depth. Of course the Hurons were quite unprepared to take advantage, or retain possession, of such an extent of territory, especially in a part of the country where arable land was rather scarce and much sought for. They allowed themselves to be dispossessed piecemeal not only of the land, but of the seigniorial dues attached to it as well, till they found themselves left with holdings totally inadequate for their support and advancement.

The property held by the Hurons of Lorette, or held in trust for them now comprises :

(1) The Village site ;

(2) Adjoining the latter, a Common, covering 8 or 9 arpents ;

(3) Two miles from the village, the Reserve proper, 1600 arpents (1350 acres) in extent ;

(4) Some 30 miles back, in the County of Portneuf, the Roëmont Reserve, 9,600 acres in area.

(1) The village plot is subdivided into small lots. Each family is entitled to an area sufficient for a house, besides a width of 30 feet in front and 3 feet at the back of that house.

(2) The Common was originally, as indicated by its French name "Clos des Cochons," a pasture for hogs. It still continues to be owned in common by the Huron community, but is now used almost entirely as a hide-dressing ground by Mr. Bastien, who has erected thereon sheds and drying scaffolds.

(3) The 1600 arpents Reserve also remains undivided. It was granted to the Hurons that they might obtain from it their annual supplies of fuel. The greater part is still woods. Six or seven families, as we have seen, have taken up their abode there as farmers, but the farming is of such a primitive character, that it has not been found necessary to trace any boundaries between the various farms.

(4) As for the Rocmont Reserve, it is wholly a distant mountainous forest tract, provided in recent times by the Canadian Government for the support of the Hurons, but neither occupied nor worked by them. However, they derive a small revenue from it, the cut of pine and spruce being leased out every year to lumbermen, and the proceeds paid over to the band in the form of allowances.

It should be observed that all of this property is held *in common* by the Hurons. With them private ownership of land does not exist. Neither have they any desire, as far as I could ascertain, to individually own land. I know only of one Huron to-day who holds privately some land—and not in the Reserve, but adjoining it. In the past as well, cases of private ownership have been exceedingly rare.

In connection, then, with the system of property of the Hurons, what strikes most the social observer, is, on the one hand, the limitation and sparseness of their holdings at Lorette, their place of abode; and, on the other hand, the absence of private ownership of land.

At Caughnawaga, things are in a different way. At an earlier date than the Hurons, the Iroquois had to forsake the chase and to take earnestly to agriculture. As a result, they acquired the notion of property, the desire to have, and the aptness to hold, land collectively, or even privately.

They managed to retain possession of part of the seigniory of Sault Saint-Louis, granted in 1681 for them to the Jesuits. It extends nine miles along the river St. Lawrence, and forms one holding of 12,600 acres. A portion conceded to white settlers yields a revenue of several hundred dollars to the Iroquois community.* Several members of the band have acquired within the Reserve possession of lots covering one hundred or more acres which they transmit freely to their children, although they are debarred from selling or donating them to outsiders. So that as regards the system of property, as well as that of labour, the Iroquois of Caughnawaga have not retained as much as the Hurons of Lorette, of the primitive status and conceptions.

But from this point onwards, the order is reversed. It has just been said that the lands retained by the Hurons at Lorette are limited in extent ; the village where most of the families live, covers only a small area. It is situated along a highway which leads to Quebec, and the French Canadian settlements surround it closely, penetrate it as it were. So much so that at many a point on its outskirts, the Huron homes almost touch those of inhabitants of French Canadian parishes.

That situation puts the small Huron community in close and constant intercourse with Canadians. It opens the doors of Huron homes to the notions and usages of the white settlers.

On the other hand, it has been noticed that the Iroquois of Caughnawaga are still the owners of large areas ; their reserve of Sault St. Louis is a compact holding of over 12,000 acres in extent. Their village (which, unlike that of Lorette, is not cramped for space) is isolated from the nearest Canadian settlements, in front by the wide and dangerous expanse of the St. Lawrence, in the rear and on each side, by a stretch of almost unoccupied woodland. Caughnawaga is indeed a closed group, a community locked up as it were to the rest of the world, and wherein Iroquois manners and traditions have been preserved as in a hot-house.

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*Besides there has been set apart for the Iroquois of Sault St. Louis, a reserve covering 18,500 acres, in the township of Doncaster, County of Montcalm. It is as yet wholly a forest tract which the Iroquois do not work. As in the case of the Hurons of Lorette, the cut of timber is leased to outsiders for the benefit of the Iroquois community.

These features of property at Lorette and at Caughnawaga and the diversity of the conditions of neighbourhood resulting therefrom, will enable us to understand the sudden change of front which presently takes place in the social advance of both our types.

At the start, we found that, taking into account the character of the country inhabited, the forms of labour resorted to, fitness for steady work and ability to hold property, in short all that makes up the *means* of living, the Iroquois was not to-day so much of a savage as the Huron, had more than the latter adopted the ways of his white neighbours. It seems that the parallelism should continue throughout the whole social fabric. However such is not the case.

As soon as we take to considering the home life, the family traditions, the tongue spoken, the entire *mode* of living, then of the two, it is the Huron we find to be, the most completely assimilated to us; it is the Iroquois we find keeping aloof in many respects. That will be made clear hereafter.

Family.

The most striking feature of the family organization of the ancient Hurons and of the ancient Iroquois, was female clanship. The clans—numbering seven or eight among the Iroquois, and as many or more among the Hurons—were vast groupings of people founded on consanguinity, on a common origin. They were not mere local organizations; they were ramified throughout the country. For instance the clan of the Bear, that of the Deer, or that of the Tortoise, had adherents in all the villages, or at any rate in all of the four nations which made up the Huron confederacy. So that, while the people were, for purposes of livelihood, dispersed in distant villages, and for political purposes, broken up into nations, still they were held fast together by the strong bond of the clan founded on family relationship.

A peculiar character of the Huron-Iroquois clanship was that it existed, and was transmitted, not through the men, but through the women of the tribe or family. The Huron child did not belong to the clan of his father, but to that of his mother. In the same way, the possessions of a deceased Huron chief did not go to his sons, but to his brothers, or to the sons of his

sisters, that is to members of his own clan, to which his own children did not belong.

When I visited Lorette, and later on Caughnawaga, I was anxious to find out whether there was left any trace of the old-time female clanship. At Lorette, not only did I ascertain that the clan was no longer a live institution; but even the memory of it had become very dim. The members of the band whom I questioned on the subject, were not totally ignorant of the clan, but they invariably connected it with male descent. One man, seventy-six years of age, told me he belonged to the clan or "compagnie" of the Deer, because his father had belonged to it. Another claimed to be of the "compagnie" of the Tortoise, also because his father had been of that clan; and to remove my doubts, he added: "How could I belong to a Huron clan through my mother, who was a French Canadian?"

One day, I spent a couple of hours chatting with Thomas Tsioui, a typical old Huron (about 80 years of age), living on the 1600 arpents reserve. Three of his sons still living are hunters as much as conditions permit; he himself spent the greater part of his early life in the woods, and at one time he was a noted long distance runner at the Quebec and Montreal exhibitions. He was very proud of a picture hung up in the best room of his house, a portrait of George IV., a royal gift to Michel Tsioui (my host's father), when as one of the Huron delegation he visited London in 1824. The old man's contention is that the Tsiouis are the only genuine Hurons, all the others being descendants of French Canadians who stole their way into the Huron community. As I objected that the Tsiouis themselves could not claim pure Huron extraction, their mothers and grandmothers in most cases being French Canadian women, the old man argued with great warmth that man, and not woman, the husband, not the wife, made the race. He was seemingly unaware that this was the very opposite of the Huron doctrine, and that his use of such an argument was good proof to me that he was no longer a Huron in respect to some of the fundamental traditions of that people.

At Caughnawaga, on the contrary, I found the tradition of female clanship still quite fresh in the minds of young men as well as old. On one occasion, as I was being rowed across the St. Lawrence by Batiste Canadien and two other Iroquois, I ask-

ed one of them, a man about thirty years of age, if he belonged to any clan. "To the clan of the Wolf," was the prompt reply. "That is because your father belonged to that clan?" I enquired again insidiously. "Oh no," replied the young Iroquois, "my mother belongs to that clan. Clan always goes by the mother, not by the father."

A simple phenomenon which marks the evolution of our Hurons from the patriarchal community and clanship of their ancestors to the restricted family group of to-day, is the adoption of distinct family names, transmitted from father to son. With the ancient Hurons as with the ancient Iroquois, there really did not exist any permanent family names, other than those of the clans. Each individual was given a name descriptive of himself, corresponding to the first name with us, which he did not transmit to his progeny. Each clan had its list of proper names which were its exclusive property; so that every name was not only a personal, but a clan designation as well.* After the missionaries had converted the Hurons to the Faith, they introduced Christian names. But these Christian names, like the former were not transmissible from father to son.

It was in the early years of the present century, that the Hurons of Lorette began to adopt permanent family names. As for the Iroquois of Caughnawaga, it may be stated that even now, as a rule, permanent family names transmissible from father to son, are not in use. In latter years, some families, from coming into closer contact with the whites, have adopted names which are transmitted from father to son: Jocks, Williams, Patton, Jacobs, Phillips, de la Ronde, de Lorimier, d'Ailleboust, Beauvais, Leclerc, etc. But these are mainly to facilitate intercourse with the whites, and their bearers still continue in the tribe to be designated by their Christian names supplemented by their Iroquois appellation. I made the acquaintance of an Iroquois, 80 years of age, commonly designated to outsiders as "Old Sky." His name is "Rowi Karoniontié"; ("Rowi" for "Louis," the Iroquois being unable to pronounce the letter "L"; Karoniontié meaning "Flying Sky"). Karoniontié's son will not in all probability be known

*Ontario Archæological Report, 1900; Connelly.

under the same name. In his childhood he will be designated by his Christian name, to which may be be added the mention "Karoniontié hoek," Karoniontié's son, until he himself be given an Iroquois name indicative of the clan to which he belongs. On account of that indefinite nomenclature, it is not always an easy matter to trace the genealogy of an Iroquois.

For several generations past the Hurons have been marrying white women. The French Canadian wife and mother was a potent factor of transformation at Lorette, and, of course, it was in her particular sphere, at the home, in family life, on domestic usages and manners, that her influence was felt most strongly.

Physically, the Huron type has been altered, though not by any means blotted out. The massive build and high stature which, we are told, were prevalent features among the old Hurons, are not now common at Lorette ; neither are the cheek bones and nose unduly prominent as a rule ; but the rather dark olive complexion, the almond-shaped eyes and the stiff, flat hair are often observed, and perhaps more so in young children than in grown-up people.

The Huron tongue is no longer spoken at Lorette. French has replaced it. Even the older members of the tribe, in answer to my enquiries, had great difficulty in recalling to mind a few disconnected words. As far back as fifty years ago, the Huron tongue was already out of general use here.

As regards the mode of living, that is food, shelter, clothing, hygiene and amusements, the people of Lorette are no longer Hurons ; in these respects their habits are very similar to those of the French Canadians of corresponding classes.

Having to purchase the greater quantity of the food they consume, they obtain it from itinerant traders or from dealers who at the same time supply the French Canadians of St. Ambroise. I happened to take a meal at the home of one of the poorest Huron families on the Reserve, and still remember how I enjoyed that simple lunch of milk, butter and bread, cream and fruit, which was daintily served in clean china or glass and on neat linen.

At Lorette, the houses are not commodious, and they are uncomfortably close together ; but generally there is an air of

cleanliness about them, and they nearly all appear to be as well kept as the tidiest French Canadian farmer's or mechanic's home.

The old Huron style of dress has been abandoned. I was able to discover only one member of the tribe, a Huron lady in the nineties, who still retained the traditional costume of the last century, the short skirt with the "mitasses," "leggings" and the moccasins.

At Caughnawaga, also there has been much admixture of foreign blood. Although the physical type of the Huron-Iroquois is more commonly met with and more strongly marked here than at Lorette, I am assured that there are not more than two families of pure Iroquois extraction. In olden times, a good many children captured by war parties of Iroquois raiding the New England settlements, were taken to Caughnawaga and adopted by the tribe. Numbers of the Caughnawagans trace their origin to the Williams, the Rices, the Hills, &c., of Yankee stock. At various times and under various pretences, outsiders, French, Scotch and others, and even negroes, filtered into the Reserve and intermarried with the Iroquois. But most of these foreign elements sooner or later were absorbed by the community and their descendants to-day—though in some cases their physique may tell—socially speaking cannot be distinguished from the other members of the band. The Iroquois of Caughnawaga, in contrast with the Hurons of Lorette, instead of being weakened by foreign intrusion, have been strengthened by it.

Iroquois is still the tongue generally spoken here. About one fourth of the population cannot even speak or understand any other. As you leave the train at Adirondack Junction, half an hour after emerging from the noisy thoroughfares of Montreal, with their flow of French and English physiognomies and their clatter of French and English sounds, you are surprised to find yourself suddenly amid people, in physique and language, quite strange.

You are met by massive, swarthy workmen who salute as they pass with a guttural "Sego, Sego." You proceed up the long rows of small, wooden houses, interspersed with massive stone ones, and a few of a somewhat more modern and decorative style. Some of these are very neat, but as a rule the homes at Caughnawaga did not seem to me as well kept as those I saw at

Lorette. You enter a few of these homes. The furniture is scanty and rude. Your eye catches quaint objects ; you observe a child attached to one of those portable cradles which figure in the accounts of early explorers. You speak to the occupants ; but they are old-timers, they cannot answer your questions either in English or French, but fix on you strange, inquisitive looks. On leaving the dwelling, you find on the beach outside, young men preparing to cross over to Lachine in their long boats. In voluble language which sounds like Greek to you, they are apparently bantering one another. Should you address these young men, they are well able to answer in broken French or preferably in broken English.

In many houses the women are busy at beadwork. Those met out of doors have all a blanket as head covering,-even the young misses who look a little more to style in dress, and wear finely shaped tanned leather boots.

Groups of children are playing on the public square facing the quaint church and the old priest's house, the latter dating back to the last century. The lively chatter they are carrying on in their native dialect, is unexpectedly interrupted now and then by some popular American or English tune.

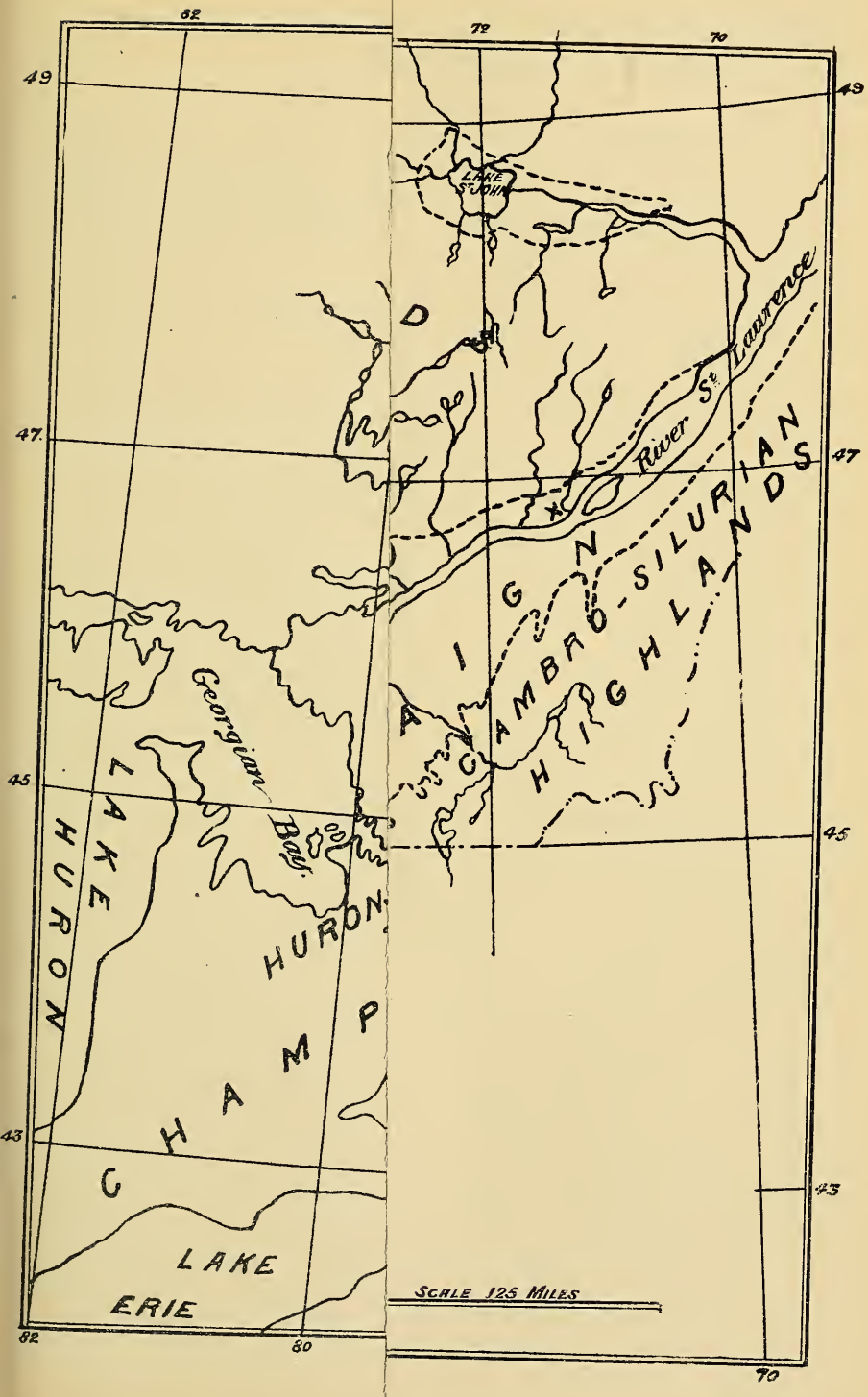
Is there not an element of pathos in the spectacle of these two groups, originally similar, but in the course of time rendered quite unlike under the sway of conflicting social factors ? Is it not instructive and interesting as well, to see that Huron, betwixt the fertile plain and the rugged mountain and forest tract, kept back by the influence of the latter in the lower forms of labour and property, but, as a further result, permeated and transformed in his home life through the influence of the French Canadian communities occupying the fertile belt. Is it not instructive and interesting to see that Iroquois, in the centre of the champaign region, constrained at an early date to give up the chase, to take to agriculture and the heavy forms of extractive labour, but, by the very fact, rendered more independent, more isolated, less open, in his home life, to the usages and conceptions of his white neighbours ?

We travel abroad ; we seek distant climes to satisfy a vain curiosity for some common-place marvel : would we not find greater profit and interest in applying part of the energy so spent

to the study of Canada? Would we not in that way put ourselves in a better position to work intelligently and efficiently for the welfare and advancement of the people? Would we not thereby become more enlightened and useful citizens, better Canadians?

The Ottawa Social Science Club, whose representative I have had the honour to be on this year's lecture course of the Literary and Scientific Society, has decided to take up, as a primary feature of its programme of work, the systematic observation and recording of social types and conditions in and about the Capital.

LÉON GÉRIN.



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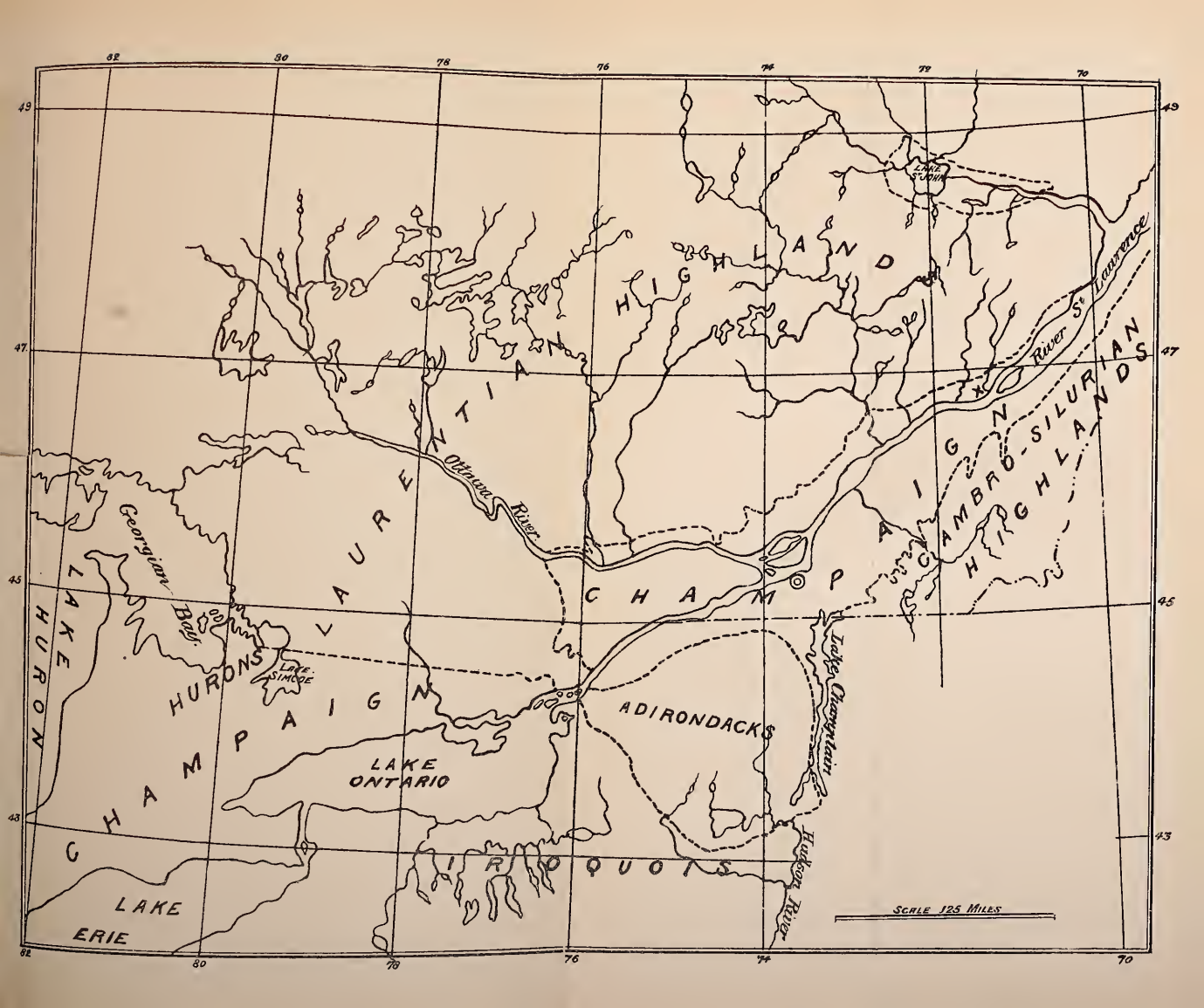
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Georgian Bay
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LAKE SIMCOE
CHAMPAIGN
ADIRONDACKS
Lake Champlain
LAKE ONTARIO
IROQUOIS
Hudson River
LAKE ERIE
SCALE 125 MILES

Notes on the Study of Language

By W. D. Le Sueur, LL. D.

To man, the thinker, there are three worlds, the world of things, the world of thought, the world of words. Not to speak too metaphysically we may say that things produce thoughts, and that thoughts produce words. Things without thoughts, and thoughts without words, have but an ambiguous existence. Through the use of words we become fully conscious of our own thoughts and of the universe. To whatever we see we are compelled to attach a name, if not an individual one, then a specific or generic one. An unknown animal is at least an animal, an unknown plant at least a plant, an unknown object at least an object. The extreme readiness with which more or less descriptive names are given by uncivilised tribes has often been remarked. Amongst the North-American Indians no visitor has long to wait before he is sized up and named, not always in a manner which he considers complimentary, but always on the strength of some salient external characteristic. The common people have named our wild-flowers, and done it upon the whole very prettily. There is no touch of erudition in such words as daisy, buttercup, heart's-ease, pansy or mignonette, but there is not a little natural poetry. The ignorant will often miscall a word with some element of which they are not familiar, and it sometimes happens that they give us something better than we had before. Our present word "wedlock" was formerly "wedlac," and meant simply "pledge-gift," referring doubtless to the dowries given with daughters; but the old English word "lac," having fallen out of use in the sense of gift, became confounded in the popular mind with the word "lock," which in pronunciation it much resembled; and thenceforth the language possessed a compound of quite different and much superior signification. It is probably not too fanciful to believe that this error on the part of the unlearned has done not a little to

strengthen the idea of marriage as an indissoluble bond. To take an example of another type, the flower which we call daffodil owes its first "d" to a popular corruption; but I do not think anyone to-day would feel disposed to quarrel with the corruption, certainly not anybody who had read Wordsworth's well-known verses ending with the lines:

> "And then my heart with pleasure fills
> And dances with the daffodils."

Language is the measure of thought. What can we *say?* That we have thought. What have we *thought?* That we can say. The rule is absolute: general poverty of language means poverty of thought. He who cannot state a case strongly has not conceived it strongly, has not seized it in its full logical development, has never clothed the bare skeleton of fact with the flesh and nerves and sinews that are needed to make it a thing of life.

It is a great miracle this of language; and it is an impressive fact that it should be possessed by one only of the innumerable tribes of living creatnres. To the human race alone was given the word, to profit withal. Some sections of the human family have not made much of the gift; and yet its possession establishes an absolute gulf between them and even the highest of the lower animals. By others it has been put to better use, and the result is seen in the great systems of thought, the great literatures, and the great civilisations which give dignity and significance to human history. Our forefathers, down to a comparatively recent time, held that language was distinctly miraculous in its origin; and certainly if, as they supposed, Adam and Eve talked excellent Hebrew in the Garden of Eden, they must have been miraculously taught it. What former thinkers overlooked was that the words of every developed language rest on a basis of experience—that no word can have more meaning than experience has put into it, and that the primal pair could not have used a language embodying experiences which their descendants, the human race had yet to gain. Milton tells us that after Adam and Eve had got into trouble over their indiscretion in the Garden, they spent hours in mutual recrimination,

> "And of their vain contest appeared no end."

Of course we allow to Milton a first-class poet's license ; but it is difficult to imagine how the unhappy couple, in their all too brief summering in Paradise, had acquired such an exuberance of verbosity. This line of Milton's may possibly have given rise to a frivolous explanation I have seen suggested of the origin of language, according to which, Adam and Eve having fallen out, "one word led to another" with the result that language was formed.

What seems truly miraculous in language, as we know it, is its wonderful power of adapting itself to all phases of human thought, to every movement of affirmation, denial, or enquiry, to the expression of every posture and attitude of the mind and every variety and degree of emotion. All that Dryden has said in his famous ode on the power of music may be applied to the power of simple words. They rouse to anger and awaken desire and draw forth compassion ; they soothe and they disturb ; they create awe and provoke to laughter ; they come with hope and healing in their wings or send the chill of death into the heart. "Great is their range," as Homer has said, "hither and thither." The mind in its growth has "woven the garment that we see it by."

There is reason to fear that the study of grammar, as it is pursued in our schools, does not place the mind at a favorable point of view for understanding the philosophy of language. It is amusing sometimes to hear the Turveydrops of linguistic propriety discussing questions of pronunciation, accent and grammar as if there were some infallible Beau Brummell to set the fashion in these things, and whose dictum only required to be known to set all such questions at rest. Professor Sweet, in his recent book on "The Study of Languages," says that, when he is asked whether it is allowable, for example, to speak of "an elegant supper," or to say of a sick person "he was bad last night," he is accustomed to answer that English is a free language. He observes also that "foreigners' English often presents the curious spectacle of a language constructed on strict grammatical principles, but with hardly a single genuinely English sentence in it"—a remark which foreigners could doubtless retort on the English when the latter try to write in another language, and have the luck, which will not often happen, to be

"strictly grammatical." In fact, on looking into one of my note books, I find that a foreigner has expressed himself very much to the point on this subject. "No foreigner" says M. Léon Hennique in the "Révue des Révues" for 1 July, 1898, "will ever be able to make entirely his own the special verbal usages of a neighboring people. He may mimic the movement of their language and write with correctness. He may learn the grammar, but he will lack the power to turn round and violate its rules with ease, grace and perfect assurance. He will not have the spirit of the language, which is the soul of those who spoke it in generations past, a kind of knowledge organically possessed and instinctively perpetuated." Professor Sweet expresses the same truth from another point of view when he remarks, in the work already quoted, that "language is only partly rational." If any language were wholly rational, a foreigner could master it just as he could master a mathematical treatise. Algebra is the same in all languages. Like the British constitution, and historic institutions generally, language is a thing of compromises. Men wanted to convey their thoughts to one another, and they did it the best way they could. From the earliest times to the present moment the race has been laboring to mould language to its requirements, and for the most part with little fear of the schoolmaster before its eyes. The work of language making has to be pretty well advanced before Quintilian appears upon the scene. Analogy is the guiding principle in the process; but analogy often goes astray, and then philological knots are tied which all the ingenuity and industry of subsequent ages are incompetent to unravel. The accidents of history too have their say. We can tell a language that has had a rich history from its variously intermingled fossil remains and disturbed stratification. Let us not, therefore, attempt to deal with language as if it were in any sense an absolute system drawn on mathematical lines; but in all our enquiries respecting it, let us take the historical point of view, seeking for facts in the first place, and afterwards endeavoring to explain them.

Formal grammar, as we know, makes much, makes everything, of the parts of speech and rules of syntax. As regards the former some of us, I am sure, in our young days learned to look upon them as having the fixed unanalysable character of chemical

elements, and certainly as being indispensable to the very existence of language. We were certain that Adam knew them in the Garden of Eden, and in all probability named them after he had got through naming the animals. Such is not the scientific view however. Science tells us of a time when there was speech, but no parts of speech. "We are accustomed," says Sayce in his "Science of Language," "to see sentences divided into their individual words, and so we come to imagine that this is right and natural. But the very accent we lay upon our words ought to show us that this is far from the truth. The accent of the word varies according to its place in the sentence; for the purpose of accent we regard, not the individual words, but the whole sentence which they compose." The sentence therefore, is the unit of significant speech and therefore—to quote Sayce again—"all individual words must once have been sentences; that is to say, when first used, they must each have implied or represented a sentence." It would really be more correct to say that words resulted from the disintegration or analysis of sentences, than that sentences resulted from the combination of words.

This may seem a hard doctrine, particularly to those who are in actual possession of a highly analytical form of speech such as the English language; but I am speaking now of language in its earliest stages and not as the finished instrument of the most advanced and intellectual races of mankind. Still the question may be pressed how it is possible, if sentences were made up of a number of distinct parts or articulations, that those parts were not prior in origin to the whole which they composed. In reply let us ask the question which I think is a parallel one: if the human body is made up of various tissues, must not those tissues have existed before they came together to form the body? In both cases we are confronted with one of the mysteries of life and organization. The sentence lives as the body lives; as a whole it expresses a meaning; sever it if you can into parts, and as a whole it dies and the parts die. Everyone knows how much difficulty is experienced in obtaining vocabularies of savage dialects, mainly owing to the fact that the savages, with all the good will in the world, either cannot tell where one word ends and another begins, or cannot give the word you want except in combination with some word you do not want. We need not, however, go to savage tribes for examples of this. Uneducated

persons writing the English language will often detach a syllable from one word and prefix it to the next, or will substitute for a word, the force of which they do not feel, another of somewhat similar sound, absolutely unmeaning as used, but which in some way embarrasses them less than the other. I have often seen the expression "at all" written "a tall," and not long ago I received a letter in which occurred the following: "Had Mr. —— *of* come to me, as he should *of* done, etc." Here "of" takes the place of "have" the force of which was not perceived—at least not perceived in such a way as to prevent its being replaced by an unmeaning preposition. If an earnest missionary from Timbuctoo were trying to acquire a knowledge of the English language from people of this grade of intelligence he would encounter difficulties not altogether unlike those which our missionaries experience in the dark places of the earth.

If therefore we go far enough back, we get to a period when as yet our venerable parts of speech were not. This is just what we should expect according to the doctrine of evolution, which tells us that progress is from the homogeneous to heterogeneous, from the undifferentiated to the differentiated, from the indefinite to the definite, from the unorganized to the organized. Just as our forefathers chipped and polished flints to make axe heads, so —though not with so clear purpose—they would chip away the superfluous parts of a sentence involving some important concept till the concept was isolated in a more or less convenient form. What particular part of the sentence eventually remained in possession of the meaning thus hammered out must, I imagine, have been in many cases a matter of accident. Let us take a modern instance. The Latins had a compound verb "animadvertere" meaning "to turn one's own (or another person's) mind to (something or other)." Owing to the influence of this much-used term the word "advertere" got to be understood more or less as carrying the unexpressed accusative "animum" with it. This "advertere" became the French "avertir," to warn or notify. "Avertir" yielded "avertissement," a warning or notification—in fact an advertisement. Now the word "advertisement" has been cut down in all the printing offices—at least the English ones—of this continent to "ad." Who could have predicted that out of the Latin word *animadvertere*,

or the phrase *animum advertere*, the prefix "ad" would have been chosen to serve millions of people as the designation of a business announcement in a newspaper? I imagine that in primitive times the prize of special and individual signification was often carried off by a part of the sentence that had no more claim to it than any other—no better claim than the syllable "ad" has to express the sense of "advertisement"—a sense which fully developed would be "an-announcement-designed-to-cause - the - public - to - turn - their-attention-to-(Mr. So and So's) goods." A syllable can stand for a good deal when once the lot has fallen on it.

The order in which the parts of speech emerged is an interesting study. Our grammars place the interjection last, but some writers hold that, if the parts of speech were treated in the order of their development, the interjection would come first. This was the opinion of the learned President De Brosses in the middle of the 18th century. Sir John Stoddart also, in his "Glossology" published somewhat over fifty years ago, declared that "Since our emotions precede our judgments, the interjection instead of being the last object of examination should first claim our notice." This is simply an anticipation of the modern view already mentioned that the unit of expression is not the word, but the sentence. Strictly speaking, instead of being a "part of speech" at all, the interjection may be regarded as *the whole* of speech, that is to say as a remnant or revival, as the case may be, of the undifferentiated speech of primitive man. There is much to be said in favor of M. Michel Bréal's theory that the pronoun is really the oldest *part* of speech. The grammatical definition of a pronoun as a word which represents and replaces a noun would not prepare us for this. How could there be pronouns, we might ask, before there were nouns for them to represent? The answer is that signs of demonstration would be almost the first need of primitive man in the way of language. The strictly pronominal use of these words would follow the birth of substantives. Whether nouns preceded verbs, or verbs nouns, has been disputed. The more probable opinion would seem to be that the verb, in its imperative form, came first. In a multitude of cases the same word would alternately be used as substantive and verb. To the thought of our rude ancestors—and here perhaps they were not far from the true nature of things—there would not

seem to be much difference between a term expressive of action (a verb) and a noun. In the fetich age which forms the back ground of all human history inanimate things were freely credited with life and power. The noun, there is reason to think, made its appearance in the double form of substantive and adjective : a thing could express a quality, and a quality could express a thing. It was in a later age that some nouns (names) were told off for exclusive use as substantives and some for exclusive use as adjectives. Next came adverbs formed from substantives and adjectives ; then prepositions which, in the main, are transformed adverbs ; and finally conjunctions, formed from whatever might come handy, and constituting the highest triumph of rational language, as being the most abstract in their nature, and thus the furthest removed from onomatopœia or the representation of things by sounds. The conjunction represents a pure thought. Nothing has so greatly contributed to produce the impression that language must be of miraculous origin as the presence in it of words representative not of things but of mental attitudes. The simple word " if " has started many a profound train of thought.

I have spoken of onomatopœia. In discussions on the origin of language it has held an important place. That it had to do with the formation of not a few vocables there can be no doubt ; and yet the so-called roots of language do not manifest its influence to any greater extent than the developed words we are daily using, many of which are clearly of onomatopœic origin. The late Professor Whitney, however, makes a very true remark when he says that " the actual permanent beginnings of speech are only reached when the natural (or imitative) basis is abandoned, and signs begin to be used, not because a natural suggestiveness is seen in them, but by imitation from the example of others who have been observed to use the same sign for the same purpose. Then for the first time," he continues, " the means of communication becomes something to be handed down, rather than made anew by each individual ; it takes on that *traditional* character which is the essential mark of all human institutions, which appears not less in the forms of social organization, the details of religious ceremonial, the methods of art and the arts, than in language."* It is manifest upon a moment's reflection that

*Encyclopædia Britannica Vol. xviii, page 768.

imitation is at once a very limited and a very uncertain thing. It is not everything that admits of being imitated, and one man's imitation might differ considerably from another's. Above all we cannot imitate thoughts. On the other hand there is no limit to what may be done by conventional and traditional signs ; and it is really not until language has assumed this character, that it is marked off by an impassable line from such means of communication as the lower animals possess.

Languages have been classified by philologists—I mention the principal divisions only—as polysynthetic, agglutinative, inflectional, analytic, and isolating. The speech of the Indians of this continent, in both its Northern and its Southern half, is of the polysynthetic order, and is believed to represent the most primitive form of rational human language. Professor Sayce sees herein "a fresh proof that America is in truth the *new* world." In polysynthetic speech a multitude of elements are crowded together in apparently unbroken connection. One word has no difficulty in picking up another, and unions are made which defy analysis. It is by comparison with these languages that we are led to see how abstract, and in a manner artificial, our own language is. To us it seems quite natural that every object within range of our perception should not only be set apart in thought, but should have a term expressive of it in its individuality and isolation. But not so with those who use the earlier forms of human speech : they do not know *things in themselves;* they have never troubled their heads with the *ding an sich.* They know things *as related;* they express things as related. I forget what Indian tongue it was in which the first missionaries could find no separate word for father or son. There were words for *my father*, and *your father*, and *his father*, and the next man's father, all kinds of concrete living or deceased fathers, but no word in which the concept, father, was isolated. So with the idea *son.* There was no word that stood for son simply. When it came therefore to translating for purposes of ritual the phrase "Father, Son and Holy Ghost," the best the missionaries could do was to take expressions which signified "Our Father, His Son and their Holy Ghost." Evidently such a language was very ill-adapted for subtle definition or rigorous argument. We cannot imagine an Augustine, an Aquinas or a Calvin giving his thought to the world through such a medium.

If anyone were to represent to an Indian that his language was very defective in not having any word for father or son, I do not know what the red man would reply, but I know what he might reply. He might say : "You want me to have words for what never existed and never will or can exist." Your reply would probably be : "Not at all ; fathers exist, sons exist." To which the Indian might rejoin : "I never saw or heard of a father that was not somebody's father, or a son that was not somebody's son ; and I don't believe you ever did either. I have all the words I want to describe the things I see around me, and do not feel that I need any others." The Indian might not perhaps conduct the discussion in these terms, but this is certainly the position he would take if he was conscious of his own case. By looking at the matter from this point of view we are enabled to see the really algebraical character of modern analytical speech, in which general and abstract terms stand for *x*'*s* and *y*'*s*. We may perhaps here glean a suggestion in regard to the education of children. We ask them at school to write essays on such subjects as the cow, the dog, the horse, when we do not invite them to higher flights on such elegant topics as virtue, patriotism and friendship. Much more suited would it be to their stage of development it we were to ask them to write an account of some particular cow, dog, or horse they happened to be acquainted with. Then they could speak of what they knew, and could express themselves with conviction. I do not know of anything likely to be more hurtful intellectually, and even morally, than forcing the young to express themselves in vague and unfelt generalisations. The young generalizer is generally a prig and runs the risk of being a humbug.

The agglutinative languages spoken chiefly by peoples of the Turanian or Mongol stock, and of which Turkish is one of the best examples, show a greater separateness in the elements of the sentence than the polysynthetic forms of speech. In the agglutinative languages words are compounded, but are not run together in fortuitous forms and combinations; and the separate parts remain, as a rule, clearly distinguishable. The union is not of that intimate character which produces internal change in the words affected. Instead of such inflections as we see in Greek and Latin, we see words which we would call prepositions affixed

to nouns and thus becoming post-positions. In this manner different cases are formed, but the "post-position" remains distinctly recognizable. Sometimes modifying elements are introduced into the body of a word. To express as briefly as possible the difference between the agglutinative and inflectional languages, we may say that, in the former, words adhere to one another without losing their identity; in the latter the whole inflectional system is founded upon the complete sacrifice of certain words to the function of modifying the meaning or incidence of certain others.

Of the inflectional languages Latin, Greek and Sanskrit are conspicuous examples. How elaborate is the accidence of Latin and Greek not a few of us know to our cost, but Sanskrit in this respect leaves both far behind. The words used to make case or person endings in these languages have been worn down to mere rudiments, the origin of which for the most part eludes all conjecture. What we all know is that, from this intimate union of a root with a modifying element, the cases of nouns and adjectives and the multitudinous forms of the verb came into existence. Meanings which in English it would take two or more words to express are in Latin or Greek expressed by one owing to the fact that the root has been modified into the sense we require by the element it has incorporated with itself. The consequence is that, to some extent, case inflections render prepositions unnecessary. In Latin we can express "eager for fame," "useful to the state," "worthy of honor," "fond of books," "oppressed by care" without using any preposition. Still the preposition was not banished. No system of inflections could be elaborate enough to express all the relations which present themselves to human thought. I think it may even be said that no possible array of prepositions could suffice for the purpose. We probably think we have all the prepositions we want; and yet we often find ourselves using the same preposition in very diverse senses—a pretty sure sign of a deficiency. There was therefore ample work left even by the inflectional languages for the preposition to do; and little as the writers of the Augustan age suspected it, that apparently humble part of speech was designed to destroy the whole case system in the family of languages founded on the Latin.

There were signs even in classic times of the coming change. Suetonius tells us that the Emperor Augustus, partly through a liking for the language of the common people, and partly for the sake of distinctness and emphasis, would sometimes use prepositions where, according to the accepted syntax, they were not required, and where, from the point of view of style, they produced anything but a graceful effect. A similar preference for prepositions is shown in inscriptions of the same period. Our Latin grammars tell us that verbs of giving take an accusative and a dative; but in inscriptions we find such expressions as "Si pecunia ad id templum data erit." The handling of the cases with elegance and accuracy was really beyond the common people. When they were in doubt they played a preposition. The result was that in a popular speech the cases became confused, and prepositions more and more abounded. It is no wonder, therefore, that in course of time the case endings were dropped and the preposition held the whole field.

The Latin and Greek verbs showed inflection to a much greater extent than the nouns, and the Romance languages of today present the same characteristic. The French verb is much more difficult to master than the English. Still, as compared with the Latin, the French verb has been considerably simplified by the use of the auxiliaries *etre* and *avoir*. Auxiliaries are to verbs what prepositions are to nouns: they serve to express the various phases which the fundamental idea of the verb is capable of assuming; and how far they can go in this direction is conspicuously shown in the English language. In addition to the verbs *to have* and *to be*, we use as auxiliaries, *shall*, *will*, *may and do*, and by their united aid get much more work out of our verbs than the Romans, or even the Greeks, could ever get out of theirs.

As compared with Latin and Greek the Romance languages, French, Spanish, Italian, etc., are highly analytic, but it is in English that the analytical principle has received its greatest development. The characteristic of an analytical language is that every thought element in a sentence has its own representative expression. As we utter a sentence in our own tongue—and the same is true in a great measure of the leading literary languages of Europe—we know from moment to moment just where we are, and how much of our intended meaning we have uttered. The

relation between a highly analytic language and a highly synthetic or inflectional one may be compared to that between printing from movable type and printing from blocks. In the analytic languages we have broken up our blocks, so that the different characters they contain may be employed in any place and in any relation in which they may be found useful. It used to be the custom to speak of inflectional languages as being more perfect than analytical ones. The great German scholar, Bopp, in his "Comparative Grammar," seems distinctly to take this view. He speaks for example of the ancient Gothic as being much more "perfect" than modern German, and of Sanskrit as being the most "perfect" language of all by virtue of the extreme elaborateness of its inflectional system. This opinion, I think I am safe in saying, is no longer held either by scholars or by men of letters. We value languages now, not according to the complexity of their structure, but according to their power, compass and flexibility. Judged by this test the English language, with its very slender accidence, can at least hold its own against any other language either of ancient or of modern times. The fact is that, while the English language is analytic in its structure, it is synthetic in its vocabulary ; that is to say a given word or phrase is capable of conveying far more emotional effect than could be gathered from its mere definition. There is that involved in it which the heart and not the intellect put there ; consequently, while the intellect has come to its rights, or nearly so, in the structure of the language, the heart has many a refuge of its own, many a stronghold, in a subtler synthesis woven of associations, and expressing itself in phrases and cadences whose effects no formal logic can analyse or appraise.

In an analytic language of this kind the power of expression by means of spoken and written words reaches its greatest height. There is a further stage, but it is one of declension and disintegration, that namely which is represented by the so-called "isolating" languages. Of these Chinese and Thibetan are well-known specimens. Analysis has here been carried to its utmost limit. Inflections have gone, grammar is little more than a matter of the order of words, all concords and relations which could give organic unity or vitality to a sentence have vanished. Each word is a naked element. Each is a symbol—that is

all—capable of being used as a means of communication. What the reactive effect of such a language has been upon the people who use it, is a profound and interesting question ; and no less profound and interesting is the question as to what the effect would be of the adoption by the Chinese nation of the English language—the only one they conceivably could adopt were they ever to abandon their own. To what extent could they avail themselves of its resources ? Would they take from it simply enough to satisfy their present intellectual and moral needs, and deform what they so appropriated ? Or would it become to them an educational instrument of inexhaustible potency ? One thing seems certain, that it could not for a long time be to them what it is to us ; and during that time, there is reason to fear, they would convert it into a dialect of very doubtful character. There are those, indeed, who predict that the future universal language will be pigeon-English. Let us hope that something better may be in store for the world ; though it might argue a little conceit to imagine that the best thing for the world would be to have the English language in its present form stereotyped for all time. The Latin language as spoken by Cicero and written by Cæsar was a noble form of speech ; but the time came when it was thrown into the crucible, to emerge as French, Spanish, Italian, Portuguese and Provençal. Its transformation was the work of barbarians ; but who would say that the barbarians did not accomplish some wonderful results ?

Let us now turn our attention to the group of languages to which our own belongs, the so-called Indo-Germanic. It is mainly through the languages of this family that the intellectual progress of the world has been, and is being, carried on. In their history we can trace the history of our own thought. The ancient classical languages had an extraordinary beauty of their own ; yet in point of fulness and precision they are surpassed by the leading languages of the modern world, We cannot surpass the beauty—word for word or phrase for phrase—of the lyric and dramatic poetry of the ancient Greeks ; still, on the whole, the mind of man has, in the present day, vaster instruments of expression, of analysis and of research at its command than in any former age. Just as the need for precision of thought made itself felt, were the means for securing it developed.

In Homer the relative pronoun—one of the subtlest and most useful products of the mind of man—is unknown. The definite article, as such, is also unknown ; so is the indefinite. In Latin, too, the articles are wanting, and though the relative pronoun is in full use (as in later Greek) there is a valuable form of the demonstrative lacking. Horace, for example, says :

> "Ætas parentum pejor avis tulit
> Nos nequiores."

which literally translated signifies : "The age of our fathers, worse than our grandfathers, has produced us more worthless still." Why did not Horace express himself more elegantly and say "the age of our fathers, worse than *that* of our grandfathers" ? Simply because he could not : the word for "that" as here used, and as possessed by the French in the form of "celui," "celle," was lacking to the language. Nor did the Latin ever develop it. Again, while the Greek and Latin languages possessed a considerable number of abstract nouns, these were not as available for use as the abstract nouns of modern speech. Where we should say "from the foundation of the city," "after the expulsion of the kings," one using the Latin language was obliged to say "ab urbe condita," *from the city founded*, "post reges expulsos," *after the kings expelled*, modes of expression which are certainly less logical and less satisfying.

The more closely we study language from the scientific standpoint the more clearly we see how far the best established and most orthodox usages are from having any absolute authority, how compromise and custom have presided over all the settlements of everyday speech. Just as titles to property become more dubious the farther we carry back our researches, so the farther we look back in language the more unsettled things become. If we have a well-established polity to-day in language, it is because those who preceded us tried numberless experiments, fought through numberless difficulties, and made ways for thought which have become smooth and comfortable by secular use. A good example of what I mean is afforded by what we call "case" in grammar. Our Latin grammars speak of six cases ; our Greek grammars of five. In English to-day we recognize three cases only, and two of these, the nominative and accusative, are not distinguished from one another in form except in the personal pro-

nouns. Still we recognize the accusative case and talk of its being "governed" by transitive verbs and prepositions. If the question is asked: Why is such a word in the accusative case? the answer comes pat; beeause it is governed by such a verb or such a preposition. But is there any sense in the statement? Strictly speaking there is not. No word causes, or can cause, any other to be in any case. The truth is that there are just two logical positions a word representing a person or thing can be in. It either is or is not the subject of the sentence. If it is the subject all you need to do is to give it its predicate and you have an intelligible statement. If it is not the subject, and yet you require to mention it, you just have to tumble it into the sentence and trust to the use of conditioning words to put it into its right position, that is to make it clear why, and in what relation, you mentioned it. The words that are said to govern it are simply those you employ to make, not the word itself, but its presence in the sentence intelligible. Of itself and by itself it is passive, inert, lifeless. It does not stand erect like the subject and claim a predicate. The other words do not put it into the accusative case, or the passive case, as I think it might better be called; they have come to see what they can do to put it on its legs, so to speak, in some way or other.

Michel Bréal has so well explained the matter in his "Essai de Sémantique" that I should like to be allowed to quote the passage:

"Just as the stones of an edifice, which have long been closely and compactly joined, end by forming one single mass, so in language certain words, as the result of contact, seem to fit into and clasp one another. We are accustomed to see them in juxtaposition; and, through an illusion of which the study of language furnishes many examples, we assume or imagine the existence of some hidden force which brings them into connection and subordinates one to another. Thus arises the idea of a *transitive* force residing in certain kinds of words. Everyone knows the difference between so-called neuter, or intransitive, and transitive verbs, the first expressing a complete action (like *run*, *walk*, *sleep*, &c.) while those of the second class require what is called a complement. The question has been raised, which of these two classes of verbs is the more ancient. To my mind there is no doubt as to the answer: not only are the neuter verbs the older, but we must allow that there was a period when there were none but neuter verbs. Words were created in the first place to have a full meaning of their own, and not to serve the purposes of a syntax as yet unborn. Some of these verbs, having frequently been associated with words which limited their scope by bringing their action to

bear on a certain object, the mind became so accustomed to an accompaniment of that nature, that in course of time this addition, or complement, to the verb came to be regarded as necessary to it. Then, by a mental transfer which finds analogies in other fields of study, men were led to believe that they felt *in the words themselves* that which was the mere result of habit. Henceforth they were in possession of verbs which *required* a complement: the transitive verb was born."

Yes, the transitive verb was born, and an important step was taken towards the establishment of that mutual dependence of words on one another which is the highest characteristic of organized and developed human speech.*

Nothing seems more incomprehensible at first sight than the wealth of inflections possessed by such languages as Greek, Latin and Sanskrit. How did they come into existence? How did the frost pictures which we see on our window panes on cold winter mornings come into existence? They are very elaborate and delicate and beautiful: one might suppose an artist hand had been at work; but if we enquire into the matter we find that all is accounted for by the laws of crystallisation. In the case of the inflections we have, in lieu of the laws of crystallisation, the effort or *nisus* of man's developing thought towards definiteness, completeness, and harmony of expression. Any chance addition to a word, which had in some way or other the effect of causing it to be understood with a certain modification or direction of meaning, might become the foundation of an inflection, and be extended by analogy to other words.†

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*In the paper as read examples were given of the development of intransitive into transitive verbs. Some condensation being necessary in publication, these are here omitted.

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†M. Paul Regniaud, in his able but somewhat too dogmatic work, "Elements de Grammaire Comparée du Grec et du Latin," (Paris, 1896) takes precisely this view. Discussing the question of the origin of "reduplication" in Greek verbs he says: "L'origine du redoublement est sans doute independante de toute préméditation. Il a dû resulter d'abord de combinaisons phonétiques naturelles ou fortuites du genre de celles qui le distinguent, et dout le caractère particulier a été reproduit artificiellement dans la suite pour donner naissance, d'après les procédés analogiques que nous connaissons, à des series de formes nouvelles; et celles—ci ont reçu ainsi la figure et la fonction mêmes dont

Take an example from our own language. If any one were asked the sense of the word "up," he would probably say that it signified position or movement away from the earth's centre of gravity. Were he then asked to explain the use of the word in such expressions as "to finish up," "to do up," "to round up," "to size up," he might be a little at a loss to show how they exemplified the meaning first given. On some occasion the word must have been applied to some particular verb in order to fill out its meaning, and, seeming to answer the purpose, it was applied to others. In the inflectional languages certain modifying elements have been not only appended to roots or stems, but have been so completely incorporated with them, that it is now, in most cases, impossible to say what they originally were, or what, if any, independent significance they ever had. Brugmann in his "Comparative Grammar of the Indo-Germanic Languages," a work of the highest authority, states the case as follows: "All the developments of language denoted by the terms stem-formation and inflexion are based upon one common principle, the juxtaposition and more or less intimate fusion of elements which were originally independent. By this process units of speech were formed which in later ages became the types on which new words were made. Many such types or standard forms were in use long before the dissolution of the pro-ethnic Indo-Germanic community." A "stem" may either be a simple root, or a root with some permanent addition to it, to which the inflexional suffix is further added. It is very difficult in certain cases to say whether a given stem is compound or not. Words, like people, are not always as simple as they look. Take a few samples from our own language. Who at first sight would say that the word "cull" was a compound? People who think that all short and pithy words in the language must be of native origin, would likely pick out the word "cull" as an illustration of the strength and brevity of our Saxon roots. In point of fact, "cull" is a compound word of Latin origin; it comes from the Latin "colligere" through the French "cueillir."

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leurs prototypes s'étaient trouvés spontanément investis à l'origine." There is a fine example of spontaneous reduplication in the word "teetotaler"; and the tendency is exhibited in the story of the Western man who asked an English traveller how he had left "Alfred A. Tennyson and Thomas T. Carlyle," adding "They kin sling ink them fellows, they kin."

Or take such words as "aid," "aim," "spy," "daub," "van" or "rest.". They look simple enough, but every one is a compound: "Aid" is from Latin *adjutare* through French *aider;* "aim" from Latin *adestimare*, through obsolete French *esmer;* "spy" from Latin *auspicari* through French *epier;* "daub" from Latin *dealbare* through French *dauber;* "van" from the two Latin words *ab ante* through the French *avant;* and "rest" from the Latin *restare* through the French *rester*. Who would suppose that "aim" contained three distinct elements, the preposition *ad*, the substantive *aes*, meaning "copper," and the termination *timo* or *tumo* seen in such words as *aestimo*, *autumo*, *optimus*, etc.? Or that "spy" involved the Latin word for "bird," *avis* and the root *spec* meaning "to see" or "to watch for"? Or that "daub" meant originally to cover over thoroughly with white, having the same origin as the beautiful French word *aube*, meaning *the dawn*, as well as the ecclesiastical term "alb"? Were it not for the link supplied by the French language, it is very doubtful whether the compound character of a single one of these words could be recognized. It is not only in the English language that such contractions occur. The German language contains a very short word "amt," meaning "office," which no one would readily suspect of being a compound; yet, barring the personal ending "or," it contains all the stuff of the very imposing word "ambassador." We may judge from these examples of the extreme difficulty of determining whether certain very ancient Latin or Greek words are simple or compound.

Most suffixes, Brugmann remarks, serve a variety of purposes. This we may observe in English. At a very early date the suffix "ing" was invented, how we do not know. Earle in his "English Philology" says that it originally signified extraction, like the Greek termination "*ides*" in such names as Simonides, Euripides, etc.; but if so it greatly widened its scope in the sequel. Picking up an "l" by being added to words ending in that letter, it sallied forth with this addition, and we soon find it doing duty as a diminutive ending, an entirely new function. Apart, however, from its achievements as "ling," we find it employed to give a collective sense as in the word *shipping*, to express the material of which a thing consists, such as *towelling*, *shirting*, *planking*, etc. In like manner the Indo-Germanic suffix

go or *ko*, as seen in Greek adjectives ending in *kos*, like *physikos*, *logikos*, etc., and in Latin words like *antiquus*, *pudicus*, *unicus*, served when added to substantives to produce a slight modification of meaning, the derivative signifying something tantamount to, or in a general way resembling, the original. "Hence," says Brugmann, it was often used to form diminutives—precisely like our "ing."

An interesting illustration of what can be done by the aid of the *ko* or *ki* element—the vowel in such a case does not count for much—is afforded by the word *reciprocal*, which of course we get from the Latin "reciprocus," or as we ought to call it, "rekiprocus." The first half of the word would suggest the verb "recipere;" but there is no thoroughfare in that direction. To understand the etymology of the word "reciprocus" we must divide it into four parts—re-ki-pro-kus; and we shall then see that it consists of the prepositions "re" and "pro," with the "ki" suffix appended to each, and that its exact signification, therefore is "backward-like, forward-like," in other words, "in a backward direction, in a forward direction." Is not this just what we understand by "reciprocal," *working both ways?*

A very considerable essay could be written on the suffix "ki." As already mentioned it is sometimes used with diminutive effect. Brugmann cites examples from the old Aryan speech as well as from Greek and Latin. A Latin example is *homuncio*, meaning "mannikin," from *homo*; but, as a usual thing, the "ki" in Latin was associated with a second diminutive element "lo." Thus *homuncio* becomes *homunculus*; and the same combination appears in *nubecula*, "a little cloud," *musculus*, *corpusculum*, *cubiculum* and many others. It has been the fate of diminutives in most languages to lose after a time their diminutive force; and sometimes what was once a diminutive will replace and displace the word from which it was formed. The words "spectacle," "article," "receptacle," and many others are diminutive in form but not in sense. On the subject of diminutives in general the remarks of Earle in his "Philology of the English Tongue," are sound and penetrating. "The general motive," he says, "of the employment of such words is to escape conventionality; that is to escape the triteness and dryness of that which is current and hackneyed, and this because the speak-

er longs to mingle with his words something of character or of humour or of good fellowship—in a word something personal and emotional. Now, it is plain without reasoning that to call each thing by the name that everybody calls it, without any little twist or twirl, is apt to seem commonplace and vapid. Consequently there has been found in most languages a faculty of shaping certain words to the temper of the speaker, or, so to say, of giving them a moral coloring. Emotional substantives have been commonly called "diminutives" because the sentiments that have been most active in this work have been those of affectionate partiality on the one hand, or of contempt on the other ; and therefore the idea of little has been much felt in this strain of words." This statement of the case may be aptly illustrated by a passage from Robert Louis Stevenson's recently published correspondence. Speaking of Sir Walter Scott he says : "With all that immensity of work and study his mind kept flexible, glancing to all points of natural interest. But the lean hot spirits, such as mine, become hypnotized with their *bit occupations* if I may use Scotch to you—it is so far more scornful than any English idiom." The word "bit" prefixed to "occupations" makes a perfect diminutive, and conveys a delightfully humorous sense of disparagement. The same word "bit," otherwise applied, will be a term of endearment, as in such phrases as "a bit lassie," "a wee bit doggie." In Latin the well-known dying address of the Emperor Hadrian to his soul is a good example of the tenderness of which diminutive forms are capable :

"Animula, vagula, blandula
Hospes, comesque corporis,
Quae nunc abibis in loca,
Pallidula, rigida, nudula ;
Nec, ut soles, dabis jocos?"

Latin, upon the whole, is richer in diminutive forms than Greek, yet the Greeks coined many beautiful words of this kind, such as "erotulos" darling, and "eidullion" an idyll. Such words as "nearos" *young*, with its feminine form "neaira," may also be accounted diminutive. Who does not remember the lines in which Milton introduces two diminutive proper names :

"Were it not better done, as others use,
To sport with Amaryllis in the shade
Or in the tangles of Neaera's hair?"

Milton, there can be little doubt, had a sense for physical, as well as for spiritual beauty ; in other words he was a man as well as a poet. The diminutive form most commonly used in Greek —let us keep to our point—is "ion," lengthened frequently to "idion," as in "encheiridion," *handbook*, "oikidion," *a cottage*, and so on. In the "Clouds" of Aristophanes, an idea strikes old Strepsiades, who is learning, or trying to learn, from Socrates to be a sophist, and he cries out, "O Sokratidion philtaton," *O, my dearest little Socrates!* One reason why Greek did not stand so much in need of diminutives as Latin, was that it was freer in its construction and fuller in its forms. Another reason was that its dialects constituted a great resource for its poets. The dramatists in their lyrical passages often dropped into Doric —to adopt a phrase from Dickens—and Theocritus, who wrote wholly in that dialect, found, as Burns did in the lowland Scotch, a vocabulary teeming, if I may use the expression, with emotional values.

Innumerable are the paths which language has made for itself, innumerable as the moods and necessities of the human mind. Some of these paths we can trace, but others are past finding out. As a neat piece of word-making, I do not know of anything better—now that it is all over and our own nerves are not required to stand the shock—than the device the Latins resorted to in order to obtain a word for "all." Was there ever a time, it may be asked, when there was no word for "all" in the Latin language? Yes, there seems to have been, and there must have been a time in the history of every language when no such word existed, for the simple reason that the idea of "all" is a general and abstract one, only to be arrived at by the spiritualization, if we may so call it, of some concrete term. Any one who has ever looked into a Latin dictionary knows that the word for "all," is in the singular, *omnis*, masculine and feminine, and *omne*, neuter, and in the plural *omnes* masculine and feminine, and *omnia* neuter. Now the starting point of this well developed adjective was the nominative plural masculine *omnes*, and this was a contraction of the word *homines*, "men," with "h" dropped in true Cockney fashion. The letter "h" was a stumbling block to not a few in ancient times, just as it is to-day, though the error of using it where it was not wanted was

more common than that of dropping it where it was wanted. Catullus ridicules one, Arrius, for saying "hinsidias" instead of "insidias," and four centuries later St. Augustine said that in polite circles a man was worse thought of who dropped the "h" from the word *hominem*, than the man who hated his brother "homo" with the "h" duly sounded, which is good evidence that this terrible mistake was occasionally committed. "Omnes," having thus lost its "h," it gradually got separated in meaning as well as in form from "homines." and began to serve as an expression for "men in general," or as we might say, "all men." How slight the difference whether we say "homines mortales sunt" or "omnes mortales sunt"! Then all at once it struck somebody that this "omnes" was an adjective meaning "all;" if so it must be capable of being used in three genders and the neuter must be "omnia." But of course in that case it must have a singular too, and that according to rule must be *omnis*, *omnis*, *omne*. The thing was too good not to become current, and thus the Latin language was enriched with an adjective meaning in the singular "every" or "the whole," and in the plural "all." Some of the finer spirits—if there were any such at the time—may have winced while this little process was going on, just as some of us would wince if a word were being similarly twisted out of shape under our eyes; but who can deny that, when done, 'twas well done? Now, by the aid of the adjective "omnis," we can form such impressive words as "omnipotent," "omniscient" and "omnipresent," which certainly do not announce themselves as of doubtful origin. The humble "omnibus," to which most persons grudge the first two syllables is from the same source. Attempts have been made by some who, contrary to Pope's advice, have drunk but scantily at the Pierian spring, to give "omnibus" a plural, "omnibi;" but let us not be too scornful of our brethren. Language would have made but little headway in past ages if many such deeds had not been not only attempted, but accomplished. It is safe to say that there is no possible error or solecism, which the classic speech of to-day does not embody and authenticate.

This brings me to the last point which I can venture to touch in this very inadequate treatment of a great subject. Tennyson tells us, in one of his most popular poems, that

"The grand old gardener and his wife
Smile at the claims of long descent."

The worthy couple no doubt know that there is no getting back of themselves, and that they were, on the whole, not much to boast of. If that is not why they are smiling I give it up. Some of you will remember too, what Thucydides says about the origin of the Athenian people. He says that many stories were afloat in his time, tending to show that the Athenians had a very glorious ancestry, but that, as far as he could make out by research, their beginnings were of a very ordinary and commonplace kind. Well, as it is with nations and families, so it is with words: trace them back far enough and you come to some- to something very ordinary. Words, like families have their fortunes. Some gather beauty and honor as they come down the ages. and some gather shame and ill-repute. Let us take a few examples. "Curse" and "swear" are very ill-sounding words, but one is only a modified form of "cross," (in its religious sense) and the other is simply old English for "to declare." To "*answer*" is simply to swear or declare back. A "miscreant" is properly one who hasn't the right form of belief—a misbeliever. The word "monster" carries us back to Virgil's

"Monstrum horrendum, informe, ingens, cui lumen ademptum;"

but essentially it means something to point at, or as we might say, a show. "Muster" is the same word modified, meaning literally a "show up," if we may use the expression. We talk of "a good muster," but the adjectives that go with "monster" are all of the most defamatory kind. That popular form of imprecation which the Captain of the Pinafore used so sparingly comes from the same comparatively innocent word which yields us "damage." The word "horrid" meant originally "rough," and "hideous," (Latin, *hispidus*) had a meaning very similar. The word "outrage," which always suggests something terrible, has nothing to do with "rage," its origin is to be found in the Latin "ultra," whence the French "outre," which gives the verb "outrer," *to carry things too far*, the latter in due course yielding the noun "outrage," *the carrying of something too far*. A "demon" with us is a very bad kind of devil; but the daemon of Socrates was something half way between conscience and a guardian angel. The general meaning of the word in classical Greek was "a god,"

"a divinity." The word "ghastly" has picked up an "h" which does not belong to it, and has thereby much improved its appearance for terrifying purposes. Like the Chinese soldiers in their drill it was preparing to look fierce, and now it looks that way all the time—at least it looks "ghastly;" but it meant no more than "formidable" at the first. The word "ghost" has also been trying to frighten us with a stolen "h," and has succeeded pretty well. It has the same origin as the German "geist" meaning *spirit* in the ordinary sense, and is akin to our English "yeast."

Let us take now some very dignified and stately words. "Venerate" and "venerable" are words of the highest character, and move in the very best society; but they both are derived from the name of the most amiable and mirth-loving goddess in the Roman pantheon. What a very expressive word most would say "solemn" is. Decidedly; we catch echoes in it of a tolling bell, or of the fateful words of a judge who has donned the black cap. But after all what does it really mean? Well it means "every year." The Latin word was *solennis*, like *perennis*, the "*ennis*" representing "annus" and "sol" the old Latin adjective *sollus* meaning *all* or *every*. A "solemn festival" is therefore, strictly speaking, one that is celebrated annually. "Glorious" and "splendid" are words that think a good deal of themselves, but if we trace the first back we come to a root meaning "to hear"—indicating that the first condition of glory is noise—and if we trace back the second we come to the ancient term for the spleen, which was supposed to have something to do with the production of bile. "Splendid" therefore meant originally of a bright yellow color. Melancholy is a very sentimental word, but it too had a physiological origin. "Jeopardy" is a word which brings before us the idea of very imminent danger; but at first it had no such meaning: it comes from two French words *jeu parti*, meaning a game in which the counters are distributed equally to all the players. The poet Keats stirs our sensibilities when he speaks of "perilous seas forlorn;" but "peril" is the Latin "periculum" which means literally "a little experience." "Vengeance" is a terrible word, but the "ven" is the same root we see in "vend" and "venal." The word "soldier" calls up the noblest associations of courage, honour, and devotion to duty; yet strange to say, if we go back to its origin it means simply "hireling," one taken into pay, like

the Greek *misthotos*. It would be easy to go on for an hour with similar examples all tending to show that no word ever had, or ever could have had, any very remarkable meaning at the outset. If then we find words having very strong meanings *now*, the inference we draw is that humanity has poured into language the whole wealth of its experience, has told to it, and tried to tell through it, the story without end of its joys and its sorrows, of its struggles, its victories and its defeats, of its satisfactions and disappointments, all the travail of heart and mind and purpose that has marked its pilgrimage through the centuries. That is where language has got its meaning; that is why it is so incomparable, so overflowing, a depository of the secrets of our race. Through long ages language and the human heart have been pulsing in unison.

It would be interesting to follow out some of the special lines of development by which language as we know it has gained fullness and variety of significance ; and in doing so we could not have a more interesting or instructive guide than M. Bréal in his "Essai de Sémantique" already referred to. My time however is exhausted, and I must close by expressing the hope that what has been said has been sufficient to show that the study of language is full of human interest, and cannot without loss be ignored by anyone who cares to think over again the thoughts of his ancestors, or who desires to estimate at its full value the thought of to-day.

Earthquakes and the Seismograph.

Last Autumn your Librarian, Mr. Klotz, wrote to me asking whether I would lecture before this Society on the subject of the seismograph; and as I felt myself honoured by the invitation, and at the same time feeling a deep interest in seismological investigation, I replied in the affirmative. It was not, however, until some time afterwards, when I received from your President the programme of lectures for the season, that I realized that I had undertaken to give a lecture with a title which would certainly lead an audience to suppose that they were to hear something about the causes which produce earthquakes, as well as an account of the nature and character of the seismological investigation in which our Canadian Meteorological Service is taking part.

I was certainly somewhat appalled at the task allotted me, especially as I conceive that seismic phenomena are most certainly very closely allied to many geological problems; it required some nerve to lecture on such a subject in Ottawa, the home of the greatest and best known geologists of our country. I hope, however, that I shall be able to give you a fairly clear conception as to the causes some of which produce quakes, and can certainly indicate to you some of the methods now followed by seismologists in the intensely interesting researches in which they are engaged. But few of the opinions advanced in the paper can I claim as my own, and I have drawn largely on those of Prof. Milne, Dr. C. G. Knott, and Dr. Agamennone, men who are making seismic phenomena a life study.

There are no manifestations of the forces of nature more calculated to inspire us with awe than earthquakes; few agents have been more destructive in their effects, and to the real dangers which follow these terrestrial convulsions must be added the feelings of uncertainty and dread which arise from the fact that the earth on which we live may at any moment be the agent of our destruction. Even the feeble shocks which at infrequent intervals are felt in portions of our Dominion produce in people a

feeling of alarm. In countries where violent quakes occur, many know from personal experience that calamity may result and others know from history that the whole face of the country may be changed by land slides and sea waves. It is therefore not surprising that some of the ancient Greek and Roman philosophers, who were close observers of Nature, should have come to some conclusions upon earthquakes. Some of these old philosophers recognised that earthquakes played an important part in the formation and configuration of coast lines. In Sir Charles Lyell's Principles of Geology I find that the author has summarised the views held by some of these men. Thucydides describes the effect of earthquakes upon the coast lines of the Grecian Archipelago—Piny supposed it was by earthquake avulsion that islands were naturally formed, and Aristotle states that earthquakes have torn to pieces many parts of the earth, while lands have been converted into sea, and that tracts once covered by sea have been converted into dry land. The writings of Pliny, Aristotle and others testify that they had observed steam and other exhalations escaping from volcanic vents, and held that earthquakes were due to the workings of imprisoned wind and vapour beneath the earth's crust. But while a few of the old philosophers were ready to attribute earthquake phenomena to natural causes, most of mankind then and down through the middle ages could only find an explanation by appealing to the Supernatural, and earthshakings were attributed to the movement of a subterranean god or mythical monster. With the ancient Greeks there was a deity for every natural force, and Vulcan, the deformed son of Juno, was condemned to pass his days under Mount Etna fabricating the thunder bolts of Jove and arms for the gods and heroes of antiquity. Professor Milne tells us that in Japan it is supposed that there existed beneath the ground a large earth spider, which later in history became a catfish ; at Kashima some sixty miles northeast of Tokyo there is a rock which is said to rest upon the head of this creature and keep it quiet. At this place therefore earthquakes would not be frequent. The rest of the empire is shaken by the wriggling of its tail and body. In Mongolia the earth shaker is a subterranean hog; in India it is a mole; the Musselmen picture it as an elephant, In the Celebes there is a world-supporting hog, while in North-America the subterranean creature is a tortoise. The people of

Kamtchatka had a god called Tuil, who like themselves lived amongst the ice and snow, and when he wanted exercise went out with his dogs. These dogs were, it is supposed, infested with insects, and when now and then they stopped to scratch themselves, their movements produced shakings called earthquakes. In Scandinavia, which is essentially the land of mythology, there was an evil genius named Loki who, having killed his brother Baldwin, was bound to a rock face upwards so that the poison of a serpent should drop on his face. Loki's wife, however, intercepted the poison in a vessel ; and it was only when she had to go away to empty the dish that a few drops reached the prostrate deity, and caused him to writhe in agony and shake the earth.

Referring again to Sir Charles Lyell, I find that in 1750 the Rev. John Mitchell observes that earthquakes occur chiefly in volcanic regions, and many other writers of the last century concurred with him that it is to volcanic action that earthquakes are due. Later on Humboldt tells us that earthquakes and volcanoes result from a common cause, which is " the reaction of the fiery interior of the earth on its rigid crust." Professor Hull, Professor of Geology in the University of London, writing as late as 1892, says : "The connection between earthquake shocks and volcanic eruptions is now so generally recognised that it is unnecessary to insist upon it here. All volcanic districts over the globe are specially liable to vibrations of the crust : but at the same time it is to be recollected that these movements visit countries occasionally from which volcanoes, either recent or extinct. are absent ; in which cases we may consider earthquake shocks to be abortive attempts to originate volcanic action." We shall see later however that many geologists and seismologists do not altogether agree with this opinion. Professor Milne says :

" We know from observation that before a volcano bursts into eruption there may be many ineffectual efforts to establish a vent and each of these is announced by a sudden shaking of the ground. The final and successful effort is usually accompanied by movements more pronounced ; and from these observations alone it is reasonable to suppose that at least certain earthquakes are the immediate outcome of subterraneous volcanic action. Should the effort be un-

usually large, resulting in the disappearance of half an island or a large mountain, as was the case at Krakotoa in 1883, and in 1888 at Banaisan (Japan), the earth shaking is correspondingly greater. It is a significant fact that quakes accompanying these great catastrophes do not usually extend over very large areas; for example the area shaken at the time of the Bandaisan explosion was less than 2,000 square miles. If we compare figures like these with those which represent earthquakes some of which originate in non-volcanic districts, and which are repeated many times a year, they are insignificantly small. To produce earthquakes which are felt over areas of five or ten thousand square miles, and which give rise to waves which may be recorded at any point upon our globe, it is difficult to imagine how the primary impulse could have originated at a volcanic focus. Volcanic explosions, as we see them, seem to result from the concentration of subterranean energy at a point; while to shake the whole surface of the globe it would appear necessary that the internal effort should be exerted upon a surface very much larger than we can reasonably suppose to exist beneath a volcano.

"A very much more serious objection to the volcanic origin of the majority of earthquakes is the fact that these disturbances are common in the Himalaya, Switzerland and other non-volcanic regions. An analysis of 10,000 earthquake observations in Japan shows that there have been but comparatively few which have had their origin near the volcanoes of the country. The greater number of this series originated beneath the ocean or along the seaboard; and as they radiated inland they became more and more feeble, until on reaching the backbone of the country, which is drilled by numerous volcanic vents, they were almost inperceptible. Beyond the central range of mountains, earthquakes are only rarely experienced; and what is true for Japan seems to be generally true for the coasts of North and South America."

Geologists tell us that untold millions of years ago our earth was a globe of molten matter, as ages passed the surface gradually cooled—that a solid crust was formed. They tell us of the birth of mountain ranges and ocean depths, how continents have been lifted out of the oceans, and continents have been buried beneath the waters; and we learn that the buckling and bending of the crust of the earth as the cooling goes on is even yet in progress;

that some lands are rising, others falling. Dr. Bell can demonstrate to you that the whole basin of even our Great Lakes is tilting in such a way that, at a not distant epoch geologically speaking, Niagara will cease to exist.

The opinion of the Committee of the British Association for t' e Advancement of Science for the investigation of Seismic phenomena as voiced by Prof. Milne se ms to be that, while admitting a few earthquakes to be volcanic in their origin, the majority of these disturbances result from the sudden fracturing of the rocky crust under the influence of bending, and that the after shocks which so frequently follow large earthquakes announce that the disturbed strata are gradually accommodating themselves to their new positions.

Prof. Milne says: "Strong evidence of faulting being accompanied by earthquake motion is the fact that many large quakes have been accompanied by faults which are visible at the surface. The terrible shock which in 1891 laid waste hundreds of square miles in central Japan seems to have been the immediate result of a great fracture in the earth's crust which can be traced for a distance of over sixty miles. The surface of the ground on one side of this line has fallen some twenty feet below the former level. The main fault was accompanied by many minor dislocations, horizontal displacements and even compression, so that a river bed has been narrowed, while plots of ground which were originally 48 feet in length have had this dimension reduced to 30 feet. In the Neo valley where the devastation was greatest, whole tracts of rice fields on one side of the fault were suddenly lowered relatively to those on the other side. The horizontal displacements and vertical displacements which took place are evident to every traveller throughout the district. A compression of from 1 to 2 per cent across river beds had to be allowed for by the engineers who reconstructed the fallen bridges, while the remeasurement of land for government assessment showed that certain areas had decreased in size. It is no doubt difficult for those who live in districts where such convulsions as these are unknown, to realize these statements, but when they are admitted it is no longer difficult to suppose that such sudden changes could have taken place without serious displacements in the mountains rising from the area where they happened. A tract of country

more than fifty miles in length which carried mountain ranges several thousands of feet in height was suddenly fissured along its length ; accompanying this there was a back spring of strata released from strain and a collapse by falling of a valley bottom and its bounding ridges. The magnitude of this impulse, received almost simultaneously over a large area, caused Central Japan to shake so violently that forests slipped down from mountain sides to block up valleys, while earth waves were created which travelled round the globe."

It is undoubtedly true that earthquake disturbances are not generally accompanied by any visible fracturing on the surface of the ground; but that they may be the result of such fracturing is rendered probable by the fact that they occur in regions where secular movements are in progress, or at least where geological experience has demonstrated that dislocations are numerous.

Professor Milne remarks that throughout the world seismic energy is most marked along the steeper flexures in the earth's crust, in localities where there is evidence of secular movement, and in mountains which are geologically new, and where we have no reason for supposing that Brady seismic movements have yet ceased.

As examples of the flexures to which reference is made, taking sections running at right angles to the coast lines of the various continents, it is found that, taking 120 geographical miles as the unit of distance, on the west coast of South America they slope 1 in 20.2

The Kuriles from Urup 1 in 22.1
Japan, W coast of Nipon 1 in. 30.4
Sandwich Islands, northwards 1 in 23.5
Australia generally 1 in 91
Scotland from Ben Nevis 1 in 158
South Norway 1 in 73
South America, eastward 1 in 243

The conclusion he arrives at from this is, that if we find slopes of considerable length extending downwards beneath the ocean, steeper than 1 in 35, in such places sub-marine earthquakes with their accompanying landslips may be expected. On the summit of these slopes, whether they terminate in a plateau or as a range

of mountains, volcanic action is frequent, whilst the earthquakes originate on the lower portions of the face and base of these districts. Districts where earthquakes, often followed by sub-marine disturbances are most frequent, are regions like the north-east portion of Japan and the South American coast between Valparaiso and Iquique. Here we have a double folding, the seaboard as it approaches the shore line, instead of rising gradually, sinks downwards to form a trough parallel to the coast, after which it rises to culminate in mountain ranges. The South American trough which lies within 50 or 60 miles of the coast, like the Tuscarora deep off Japan, attains depths of over 4,000 fathoms, and the bottoms of these double folds are well known origins of earthquakes and sea waves.

The general conclusions at which we arrive are that the majority of earthquakes, including all of any magnitude, are spasmodic accelerations in the secular folding or creep of rock masses ; a certain number, particularly those originating off the mouths of great rivers like the Tonegawa in Japan, may result from sudden yielding in the more or less horizontal flow of deeply seated material, the immediate cause of which is overloading by the deposition of sediments ; whilst a few which are comparatively feeble and shake but limited areas, are due to explosions at volcanic foci.

It will then be abundantly evident that seismology is intimately connected with geology, with the building up of the land areas and mountains and conversely their subsidence below the waters. The aim of seismology is to discover something further regarding the hidden depths of the globe, knowing that any knowledge gained must be of value—and moreover it is evident from what has already been learned that a knowledge of the depths of the ocean subject to seismic disturbance may be of incalculable value to countries from whose shores cables radiate to far off lands.

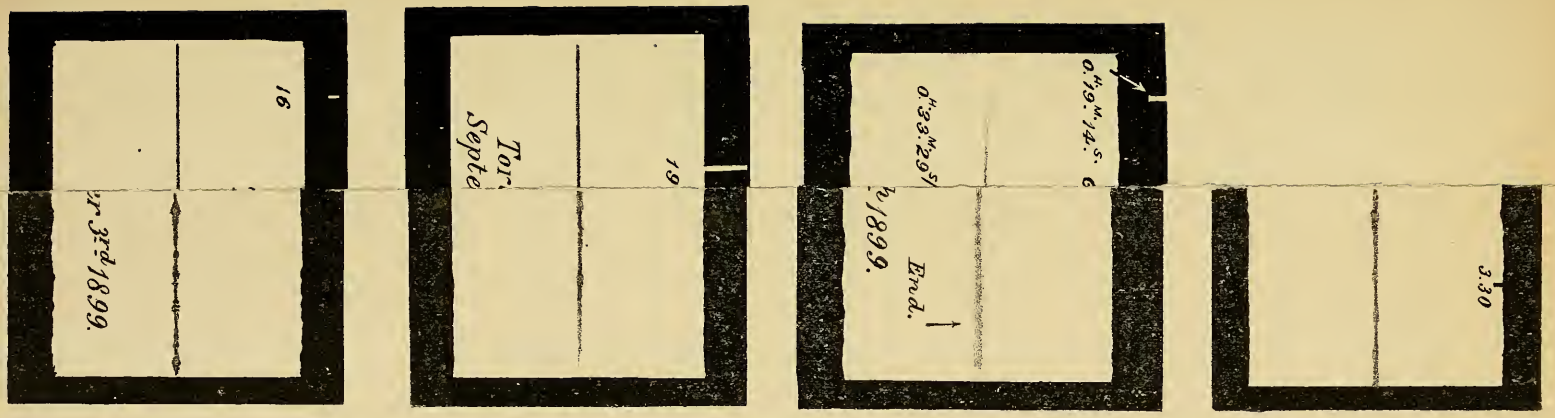
For many years there has been a section of the B. A. A. S. interested in the investigation of earthquake phenomena, and the committee of this section has of more recent years had new life infused into it by various scientific gentlemen who have resided in Japan. More than twenty years ago, when the Japanese decided that their country must be a progressive and up to date

country, they invited professors from European universities to come over and fill the chairs in their seats of learning; they invited engineers and architects from Europe and America to come and build their railways and erect their public buildings; and these gentlemen residing in Japan, occasionally felt their houses shaken by earthquakes, and at not infrequent intervals the engineers and architects saw the fruits of their labors wrecked by seismic disturbances. Naturally an intense interest was awakened and a scientific investigation of seismic phenomena was soon in progress.

Prior to 1861 Robert Mallet had studied the velocity of earth waves produced artificially by exploding charges of gunpowder varying between 25 and 12,000 lbs, and somewhat similar methods were employed by Gray, Milne and others in Japan. Professor Milne says: "The shakings were first obtained from the fall from heights up to about thirty feet of a ball approaching a ton in weight and subsequently by the explosion of dynamite and gunpowder in bore holes. The resulting vibrations longitudinal, transverse, and vertical, were recorded at a series of stations so arranged in electrical connection that the time of any vibrations could be noted to a small fraction of a second. These experiments explained many phenomena observed in earthquake disturbances, and directed attention to others the existence of which was for the first time rendered probable. The velocity of propagation of wave motion evidently increased with the intensity of the initial disturbance; it was greater for vertical and normal than for transverse waves; whilst motion was propagated more rapidly to stations that were near an origin than to stations at some distance from the same. The period of the movements increased as the disturbance died out or as it radiated. It was surmised years ago that violent earthquakes occurring at any point on the earth's surface might, if suitable and sufficiently delicate instruments were used, be recorded at any other point; and it has since been abundantly proved that the surmise was correct.

To Prof. Thos. Gray and John Milne belongs the credit of having devised a seismograph that will record the tremors propagated to far off lands.

In the spring of 1897 a letter was received from the chairman of the B. A. A. S., requesting the co-operation of the Toronto

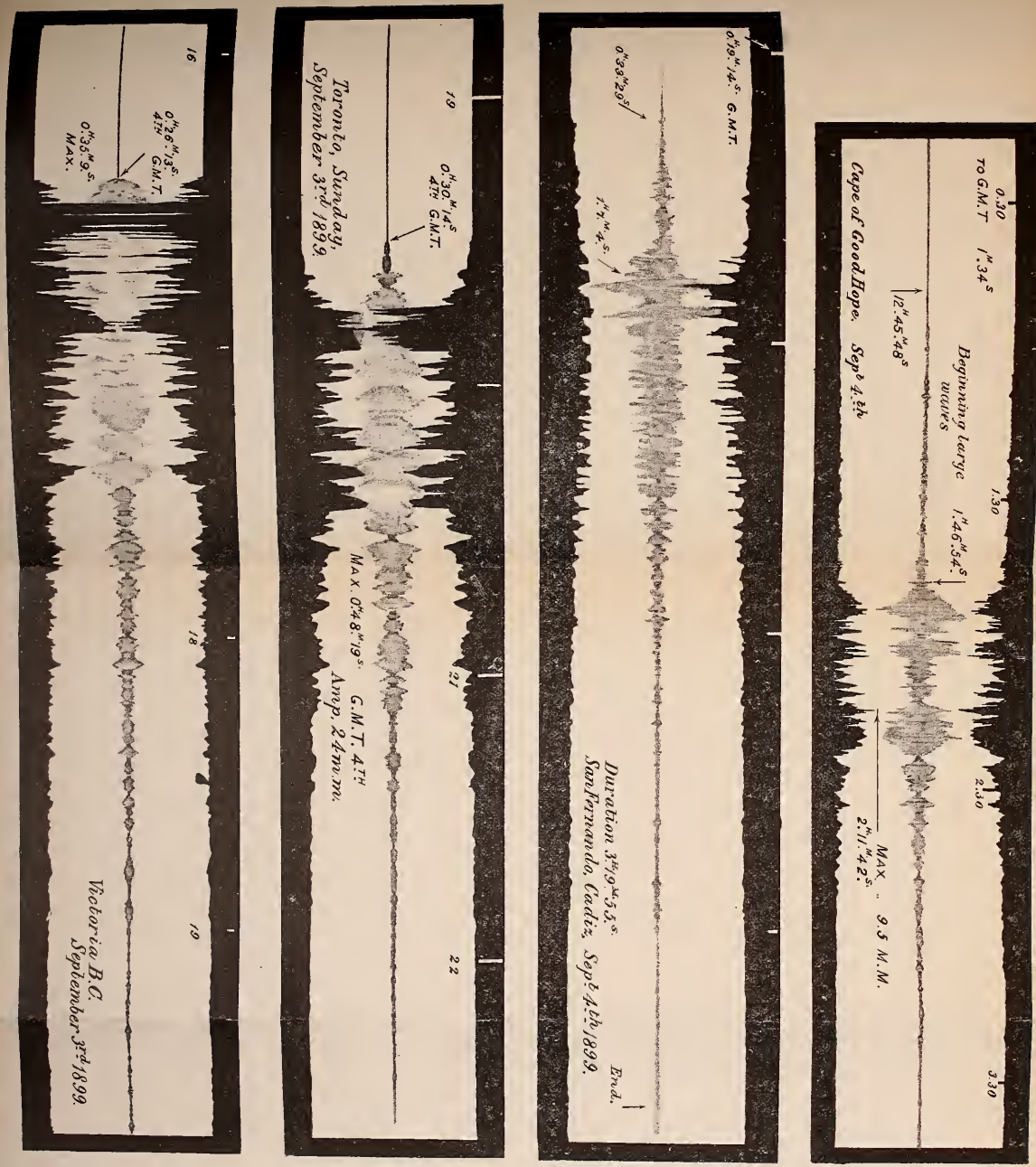


Seismograms obtained in various parts of the world illustrating the effect of an earthquake which occurred, on September 3rd, in Alaska, near Mount St. Elias, in latitude 60° N. and longitude 140° W.

The table shows the latitude and longitude of the points and their distance by great circle and chord from Mount St. Elias, and also the time expressed in Greenwich civil time at which the disturbance was recorded.

	Lat.	Long.	Arc.	Chord.	G.M.T.
Victoria	48° 25′ 31″ N	123° 21′ 33″ W	1039km.	1036km.	$0^{H}\ 26^{M}\ 13^{S}$
Toronto	43° 39′ 36″ N	79° 23′ 40″ W	2700km.	2648km.	0″ 30″ 14″
San Fernando	36° 27′ 42″ N	6° 12′ 20″ W	5256km.	4877km.	0″ 33″ 29″
Cape of Good Hope	33° 56′ 04″ S	18° 28′ 41″ E	10373km.	7641km.	0″ 46″ 12″

Value of Kilometer--6214 Miles.



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	Lat.	Long.	Arc.	Choro.	G.M.T.
Victoria	48° 25′ 31″ N	123° 21′ 33″ W	1039km.	1036km.	0h 26m 13s
Toronto	43° 39′ 36″ N	79° 23′ 40″ W	2700km.	2648km.	0h 30m 14s
San Fernando	36° 27′ 42″ N	6° 12′ 20″ W	5256km.	4877km.	0h 33m 29s
Cape of Good Hope	33° 56′ 04″ S	18° 28′ 41″ E	10373km.	7641km.	0h 46m 12s

Value of Kilometer--6214 Miles.

Observatory in a seismological survey of the world, and recommending that a seismograph of the Gray-Milne pattern should be purchased and there installed. Sir Louis Davies, the minister under whom I have the honor to serve, was pleased to authorize the expenditure of the necessary funds, and our seismograph was put in operation on September 20th, 1897, at 4 p.m.; and, as it proved, it was exceedingly unfortunate it was not started a little earlier, as at the very moment we were engaged in making the final adjustments, the earth was pulsating from the effects of a violent quake which had occurred in Borneo. The instrument used consists of a horizontal pendulum with a boom two feet six inches long, at the end of which is a plate in which is a narrow slit, parallel to the length of the boom. The position of this beneath a slit at right angles to it is shown by a speck of light from a small lamp, reflecting downwards, which photographs continuously on a bromide film two inches wide, whch passes at the rate of five feet each day. Every hour the light is eclipsed by a screen attached to the long hand of a watch, and thus a time scale is applied.

It may also be mentioned here, that when in Toronto at the meeting of the British Association, Prof. Milne informed me that the committee wished to have a station on the Pacific coast. As I knew that there was an association grant for starting some few stations, I informed him that, if the committee would supply the instrument, the Meteorological service would supply an observer; and the result was that in the summer of 1898 a seismograph was put in operation at Victoria, B. C., in charge of the meteorological observer, Mr. E. Baynes Reed.

The first earthquake recorded in a thoroughly satisfactory manner by the Toronto instrument occurred on December 29th, 1897. At 11h 22m 7s G. M. T. at Port Au Prince, Hayti, there were three violent shocks within 48 seconds. At Santiago numerous buildings were much injured. This quake had a sub-marine origin and interrupted two cables from the island. Ten minutes twenty three seconds after the first shock in Hayti our Toronto seismograph began its record, and 8m 19s later it was recorded in the Isle of Wight. I find from the British association report that the tremors were also recorded in Italy and Russia. As I would doubtless weary you were I to enumerate anything like

the full number of quakes we have recorded in Toronto and Victoria, I shall ask you to observe the seismograms for the 24th January, 1898. In response to a letter which I wrote to the Director of the Observatory in the City of Mexico, he wrote me that two shocks of earthquake were recorded in Mexico on January 24th, the first at 5.29 a.m., and the second at 5.9 p.m., the first being slight and the latter strong. The earthwaves caused by both of these quakes were recorded in Toronto and Victoria, B. C. I shall not show you the seismogram of the first as it was comparatively small, but will show you the second. Prof. Milne thinks that the time of the origin of the quake was two minutes earlier than in Mexico; if so, we have Greenwich time at origin 11h 43m 31s, beginning or preliminary tremors 6m 53s later in Toronto, and 7m 36s later in Victoria, or about a velocity of eight kilometers per second in both cases. The larger waves reached both Victoria and Toronto between 22m and 23m after the quake occurred, travelling at a rate of about 2.5 kilometers per second. This quake was also recorded at the Isle of Wight, Kew Observatory, in Russia, Italy, Trieste and Bombay; and all stations agree that the time of the arrival of the larger wave gives a velocity of about 2.5 kilometers per second measured on the arc. On 7th March the seismographs recorded a Japanese quake of much severity, the time of transit of the long waves was as follows: Isle of Wight 59m, Kew 59m, Rocca di Papa in Italy 56m, Toronto 65m, Trieste 47m.

A point of interest in these seismograms is that the tremors as recorded in England were greater than at Toronto, and at Toronto they were greater than at Victoria, the station nearest to the origin. This latter place would be reached by a path entirely beneath the Pacific, Toronto by a path crossing Behring Straits, and Shide (Isle of Wight), by a path across Asia to Europe. Such records suggest that oceans exert a damping effect upon the earth waves traversing their beds.

Many quakes followed during the next three months, but we will pass on to June 8th. There were two shocks recorded on this day, and there is strong reason for supposing that the origin was in the West Indies, east of Jamaica. The times were as follows:

		h	m	s		h	m	s
Prely. Tremors.	Toronto	4	42	27	Waves	4	54	16
	Victoria	4	48	10	"	5	9	0
		0	5	43		0	16	44
		h	m	s		h	m	s
Prely. Tremors.	Toronto	15	7	54	Waves	15	16	0
	Victoria	15	13	1	"	15	30	47
		0	5	7		14	47	0

Also the magnets at the Agincourt Observatory near Toronto began to swing at 15h 16m.

Passing on to July 14th, an important disturbance began at Victoria at 13h 41m 0s, and at Toronto 1h 27m later. The large waves reached Victoria in 8h 3m and Toronto in 19 26. The origin of this was clearly near the Sandwich Islands, where heavy quakes occurred on this day. and Mauna Loa was in violent eruption ; this disturbance was also recorded by the magnets at Agincourt.

Tremors announcing another quake began in Victoria at oh 26m 13s G. M. T. on the 3rd, September, and 4 minutes later at Toronto; and the large waves reached the former point at oh 30m 14s, and the latter at oh 48m 19s, about which time the magnets began to swing. This was the great Alaskan quake of September 3rd. The preliminary movement was registered at Kew Observatory, England, 6m 52s after Victoria, and at Cadiz, Spain, 25 seconds later. Another shock followed something over four hours later and this likewise was recorded by the seismographs in all parts of the world.

On the 10th, in the same region, two other world shaking quakes occurred. Unfortunately the Victoria seismogram was lost in the mails, but, as the slide now on the screen shows, Toronto recorded both of them and most satisfactory records were obtained throughout Europe, and presumably Asia and Africa. As at the Cape of Good Hope, the disturbance was very pronounced. I regret that so far I have been unable to discover the exact centre of these quakes ; but, from such accounts as have been received, it would appear that they were the most severe ever experienced In those regions since visited by white men.

The only other seismograms I will show you are those of a severe quake which occurred in Mexico on January 20th of this year; the preliminary tremors reached Victoria at 6h 39m 48s and Toronto 29 seconds later, while the larger waves reached Victoria at 6h 53m 38s and Toronto 2m 19s later. These figures indicate a somewhat different origin from the quake of the previous year on the 24th January; and it is probable that the centre was near Colima near the west coast of Mexico.

I have shown you a number of seismograms and read you a lot of figures; but what may we learn from them? In the first place we see that, in nearly every instance, disturbance is first indicated by a feeble movement of the pendulum, lasting during an interval of from a minute to a quarter of an hour, to be followed by a movement of much greater amplitude, which in most instances began suddenly. It is fairly evident then that, in earthquake motion, certain preliminary tremors of small amplitude outrace the larger movements, and analysis of these seismograms seems to indicate that it is quite probable that these tremors may be propagated through a very rigid interior of the earth, radiating from the origin in all directions; while the larger waves are surface waves in the crust of the earth.

Rules which are likely to prove appoximately correct are:

1. The velocity in kilometers per second with which these preliminary movements are propagated is equal to one quarter of the square root of the mean depth in kilometers of the chord or path along which we may suppose they travelled.

2. The duration of preliminary tremors, or the interval of time expressed in minutes by which they outrace the longer period waves as shown by the seismogram, equals the square root of the mean depth of the supposed wave path expressed in kilometers.

A very natural question is—"Your seismograph records the passage of these earth waves, the magnets at your observatory begin to swing—how is it then that we do not feel them?" We do not feel these waves because they are very long and slow undulations, and each pulsation may be from 50 to 60 kilometers in length.

My own study of seismograms has led me to the conclusion that there are many changes to be made before we can expect

thoroughly satisfactory results. A great advance has been made in getting instruments of the same pattern in various parts of the world; but so far sufficient care has not been taken to have them adjusted alike, and hence the pendulums respond to vibrations of different periods ; then it appears to me that the times of the cut off of light are not reliable, and this of course is a source of confusion. Matters, however, are improving in both respects, and before long we shall have observations which are strictly comparable, and results are likely to be more accordant.

Professor Milne and several other observers have found a diurnal wave in the records of seismograms—i. e. a slow tilting which takes place in piers and buildings, especially on fine days, for six or ten hours rapidly in one direction, and during the remainder of the twenty four hours, more slowly and in an opposite direction. This movement may be found underground where changes in temperature are insignificant. The actual cause of these movements is at present matter for speculation ; but the theory which best explains the phenomena they present, as for example that, on the opposite sides of a valley, it has been observed that movements take place simultaneously, but in an opposite direction, is that these changes in the vertical are due to differential changes on opposite sides of a station in the loads removed during the day, or acquired during the night, by evaporation and condensation of aqueous vapours. During the day it is assumed that, by ordinary evaporation and the transpiration of plants, the bottom of a valley loses more weight than its comparatively drier and less clothed sides.

During a hot day the stream at the bottom of such a valley should discharge fewer and fewer gallons of water, whilst the valley bed, because it is relieved of load, should rise. For the remaining fourteen or eighteen hours, because aqueous vapour is condensed beneath the chilled surface of the ground, or as i emerges from the ground on plant and other surfaces, the stream in the bottom of the valley would increase its flow; and relatively to the sides and bounding ridges of the valley, where we may suppose the conditions for condensation to be less favourable, the lower parts of the same would become heavier and consequently sink. As to whether this concertina-like opening and shutting of valleys, representing changes of slope of one or two inches in three

or four miles in the average inclination of their boundaries, really exists, all we can say is that instruments have given indications that it can be explained on such a supposition. The fact that the piers carrying some of the instruments have risen from the chalk, and not from the alluvium, and that during long continued wet weather there is a continuous creeping of a horizontal pendulum the heavily loaded valley bottom, and the direction of greatest movement at the time of an earthquake appears to be at right angles to the dip, from which it may be inferred that valleys due to geotectonic folding exhibit a certain flexibility, tend to support the idea that the observed diurnal movements are due to actual movements of more or less extensive areas. No doubt some portion of the observed effects may be directly attributable to solar radiation. In Toronto and Victoria we have not recorded such movements, and I think it is that our instruments are placed on piers built very substantially and very deep.

TOTAL NUMBER OF QUAKES RECORDED AT TORONTO AND VICTORIA, B. C.

	VICTORIA		TORONTO
1897		From Sept. 20	12
	From Oct. 11.		
1898	9		30
1899	111		135
1900	25 to Feb. 13th.		19
	155		196

Table Showing Length of Chords in Miles and Kilometers.

Assumed	Lat.	Long.	Victoria		Toronto		Shide, Isle of Wight	
Radius: 6360 Kilometers 3951.9 miles			Lat.	Long.	Lat.	Long.	Lat.	Long.
			48° 24'	123° 19	43° 40'	79° 24'	50° 42'	1° 18'W
Hawaii	21° 18'	157°55'w	Miles 2899	Km. 4650	Miles 5048	Km. 8124	Miles 7307	Km. 11759
Mexico	19 26	99 7	2512	4043	2103	3385	5905	9503
Port au Prince	18 35	72 18	3716	5980	1777	2861	4757	7655

WELL WATERS: A STUDY

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When rain falls to the earth it is either absorbed by soakage, or it flows along the surface to lower levels. Usually both flow and absorption take place, but the ratio between the quantity carried off by surface flow, and that absorbed, varies with the nature of the soil, the degree of slope, and other conditions.

When the surface is nearly level, and porous, as is the case with ordinary arable land, most of the water will disappear by soakage, and if the rainfall is heavy, the ground will be wetted to a great depth.

In the diagram (Fig. 1) the dotted portion represents a layer of porous soil, S—(which may be sand, loam, gravel, etc.), underneath which lies a non-porous layer, C (clay), represented

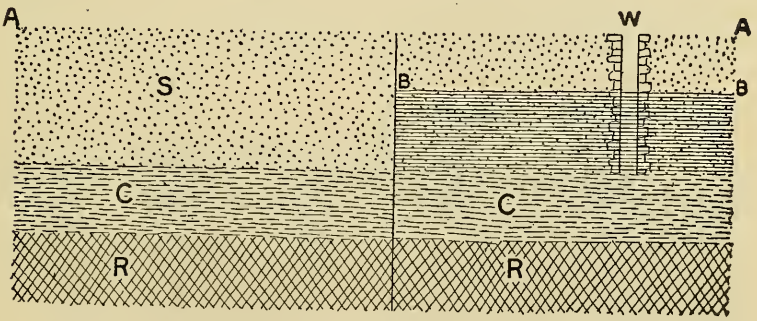


Fig. 1.

by short lines, and underneath this again is a layer of rock—R. The rain which falls on the surface A, will gradually sink through the porous soil till it reaches the impermeable clay ; and shortly after the rain ceases, we may have the state of things represented at the right hand side of the diagram, which shows the porous soil thoroughly soaked from the surface of the clay up

to the level B. This last is the so-called *ground-water level*; and it is evident that the depth of the ground-water level, below the surface level, will vary with the rainfall, and with the thickness of the stratum S: will be highest after heavy rain, and lowest after prolonged drought.

For every region an average may be struck, which is known as the mean annual ground-water level, and we may suppose B to represent this mean level for the area under consideration. If now, a well be sunk, as at W, to the clay, this well will contain water to the depth of the average ground water of the locality. If the well be carried lower, *i.e.*, into the clay, the result will not be to change the character of the water, but merely to enlarge the storage capacity of the well. Extensive areas of level land, as in prairie regions, beaver meadows, etc., answer to the conditions described; but certain other characteristics of ground-water must be considered.

Ground-water is never stagnant, but is moving more or less rapidly towards some line of lower level, where a brook, or river, or lake will generally be found. In Fig. 2, D represents a section of a stream, whose waters will evidently rise and fall with the level of the ground water, which supplies them; and we must discriminate between this rise and fall, which is always gradual, and that sudden rise, of short duration, which results from the surface flow immediately following heavy rain.

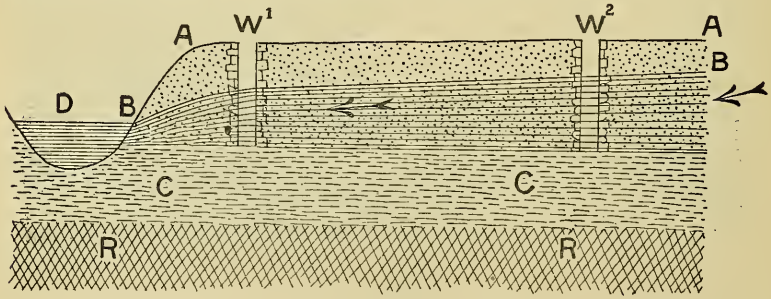


Fig. 2.

The flow of the ground-water will be in the direction indicated by the arrows, *i.e.*, at right angles to the course of the stream, and the line B B, will be a gradually sloping one, so that the well W¹ will contain less water than W² at the same

time, although the wells may be of the same depth, and penetrate identical strata of sand, gravel, etc.

It must not, however, be supposed that stratification of so simple a type as I have described, is at all common. Soil, by which I mean everything that is not rock, has resulted essentially from the operation of chemical and mechanical forces upon solid rock. The chief of these forces have been, (1) the freezing of water in the pores of the rock, thus breaking it up ; (2) the action of rain ; (3) the alternate expansion and contraction by heat and cold ; (4) attrition of stone upon stone at the bottom of rivers and lakes ; (5) the movement of large ice masses (glaciers) ; (6) solution of certain rock components, with the consequent falling apart of the residue ; (7) action of the roots of plants, which action is both mechanical and chemical ; (8) chemical action by oxidation, formation of carbonates, etc. Many of these changes have taken place under water, and every part of the earth's surface has again and again been the bottom of lake or sea, so that soil formed by the means described, does not necessarily remain on the spot which produced it, but may lie hundreds of miles away. Thus, soils which have resulted from the attrition of rock masses in the regions round about Algoma, now cover the fields of Southern and Eastern Ontario. This sort of thing has happened the world over ; and the carriers of these immense masses of clay, sand, gravel and boulders, have been ocean and river currents ; but above all glaciers and icebergs.

An iceberg is not a large block of clean, pure ice, but a section of a glacier, broken off by the lifting power of the ocean when the moving mass has been so far thrust into its waters that their buoyancy overcame the strength of the ice, and a huge mass snapped off, rose to the surface, and was carried out to sea. This ice mountain contains, frozen into it, perhaps thousands of tons of rock detritus. It floats out to sea, and wherever it melts, this soil-forming material is deposited, perhaps forming a heap or hill, perhaps being strewed along the course of the floating bergs. After a period of submergence, which may be hundreds of thousands of years in duration, subterranean forces cause, what was so long sea bottom, to become dry land ; and we can imagine the condition of things described

without too much difficulty, since a little observation of regions quite accessible to us, shows us very marked traces of the period itself. Of course the influence of new forces comes into play on what is now dry land. Atmospheric effects, vegetable and animal life, sunshine and storm play their part in altering the surface ; and in the end this comes to be just what we find it, the very ground upon which we build our houses and in which we dig our wells.

In Fig. 3 we have a somewhat more complex section diagrammed, representing a state of things much more usual than the very simple conditions described in Figs. 1 and 2.

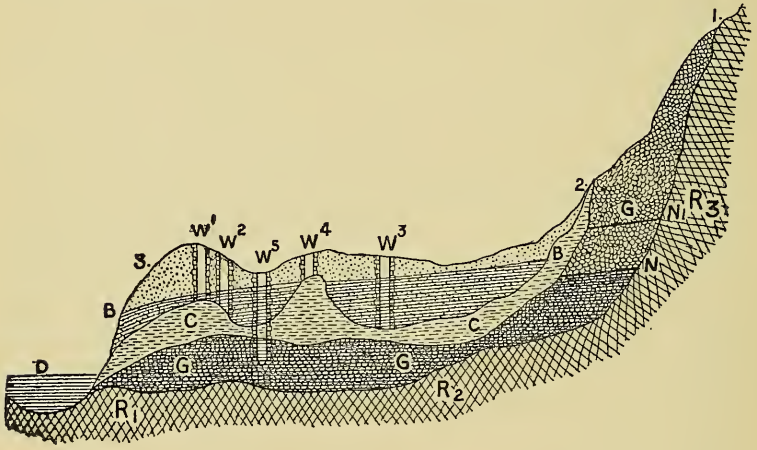


Fig. 3.

Here we have the rocky substratum R, more or less contorted throughout, and upheaved as a mountainous ridge at R^3. Conformable to the surface of the rock, but of varying thickness, we have a stratum of gravel, G, which crops out on the surface between 1 and 2. Lying on this gravel is a layer of clay, C, which varies in thickness, and comes to the surface at 2. Overlying this, is the soil, S. The line B^1B^2, represents, as before, the mean level of ground water, with a gentle slope towards the drainage stream D. The rain, which falls on the region 2 to 3, supplies this ground water, which is tapped by the wells, W_1, W^2, W_3. It is at once evident why a well at W^4 remains dry, or only contains water when the season is abnormally wet. The rainfall on the rocky surface to the right

of 1, is of course not absorbed to any great extent, but flows down to the gravelly surface between 1 and 2, and together with the rain falling on this surface, is absorbed by the gravel, and finds storage in it between the rock (R) and the clay (C). Here it accumulates in a second and lower water-bearing stratum, and the normal level for this water supply may be represented by the line N. Now it is evident that if any of the wells W^1 to W^4 be continued through the clay, they will obtain a water supply from this lower gravel; and the well W^4 can get a permanent supply from no other source. W^4 then becomes an illustration of a so-called 'deep well,' and in wet seasons, when the level rises above the normal N, say as high as N^1, this well will overflow, or become what is called a 'flowing well,' on the principle that water rises to the same height in all tubes connected with a common reservoir.

If I have succeeded in making my subject understood, we are now prepared to begin the special enquiry that I wish to propose for your consideration. Up to this point, I have merely defined and illustrated certain terms that I shall have to use repeatedly in the sequel. To recapitulate briefly, I have spoken of three classes of wells, viz.: those fed from the normal ground-water, those fed from a deep or secondary water supply, and those so-called surface wells, which, like W^4 in Fig. 3, receive soakage water only, and contain a supply only when the ground in the immediate vicinity is wet, as in Spring and Autumn. All the ground-water wells diagrammed, are represented as dug down to the subjacent clay; but this is not a necessary condition. W^3 for example, would be none the less a ground-water well, had it been made no deeper than W^1 and W^2. We have now to consider the character of the water which fills these three types of wells.

Rain water is not the chemically pure substance which it is often described as being. In the later stages of a prolonged rainfall, it is indeed very nearly pure, but the first portions of every shower wash out from the air, not only the gaseous impurities, which are the products of animal and vegetable decay —(Ammonia, compound or organic ammonias, sulphuretted hydrogen, etc.)—but also those solid particles, rich in microbial life, which form the dust of the air, and are partly organic and partly inorganic in character. This rainwater, falling upon the

surface of the ground, flows along this surface, or soaks into it, taking momentarily into solution more and more of the soluble matters with which it comes into contact. These are partly inorganic salts, chlorides, sulphates, carbonates, silicates, etc.—and partly organic matters of more or less complex nature, the products of the decay of vegetable and animal matter. If, for example, in Fig. 3, the region 2 to 3 is a cultivated farming country, somewhat sparsely inhabited, the organic impurities will chiefly be of a vegetable kind—rotting vegetation, the manure of the fields, etc. ; but if it be a village or town, the organic matters will be more largely of animal, and especially of human origin. To these waste products the term sewage is properly applied. The ground-water of this region may be, therefore, much less pure than was the rain water that fell on the surface or gathering-ground. I say *may be*, for reasons which will be presently given.

We may dismiss the *inorganic* impurities with a word, by saying that, unless they are present so largely as to give a distinct taste to the ground-water, they are rarely of a kind to be dangerous to health. The *organic* matters must be more carefully considered. If they have originated in normal decay, they may be harmless from the point of view of health, even though far from appetizing when we remember their origin ; but if they come from those conditions of decay which we call *disease*, they may be actively poisonous, and may contain the living germs of specific diseases, such as fevers, diphtheria, cholera, etc.

Percolation, though a fully ærated soil, has, however, the effect of bringing about purification of such water by the process of oxidation, a process by which organic matter is changed and microbial life destroyed. That this should be effective, the water must filter through several feet of sand or gravel ; and although it is impossible to fix a definite minimum limit to the depth of such a natural filter, it is safe to say that we should insist on ten feet, at least, and prefer as much more as we can get. To this end it is necessary that the upper ten feet of the wall of a well should be made quite impervious to water, and the accompanying diagram shows how such a construction can be brought about.

A well should be so constructed that no water could find entrance to it without filtration through a depth of soil, at least

equal to the vertical distance between the ground level, and the lowest level of ground water. To insure this it is necessary to have the mouth of the well raised a foot or more above the surface of the surrounding soil, and to have the brick (or stone) lining of the well backed up by a layer of puddled clay, a foot or more in thickness, and extending continuously from the level of the ground water quite up to the mouth of the well.

DIAGRAM of well; showing a backing of puddled clay, or other impermeable materia between the brickwork and the porous strata through which the well is dug.

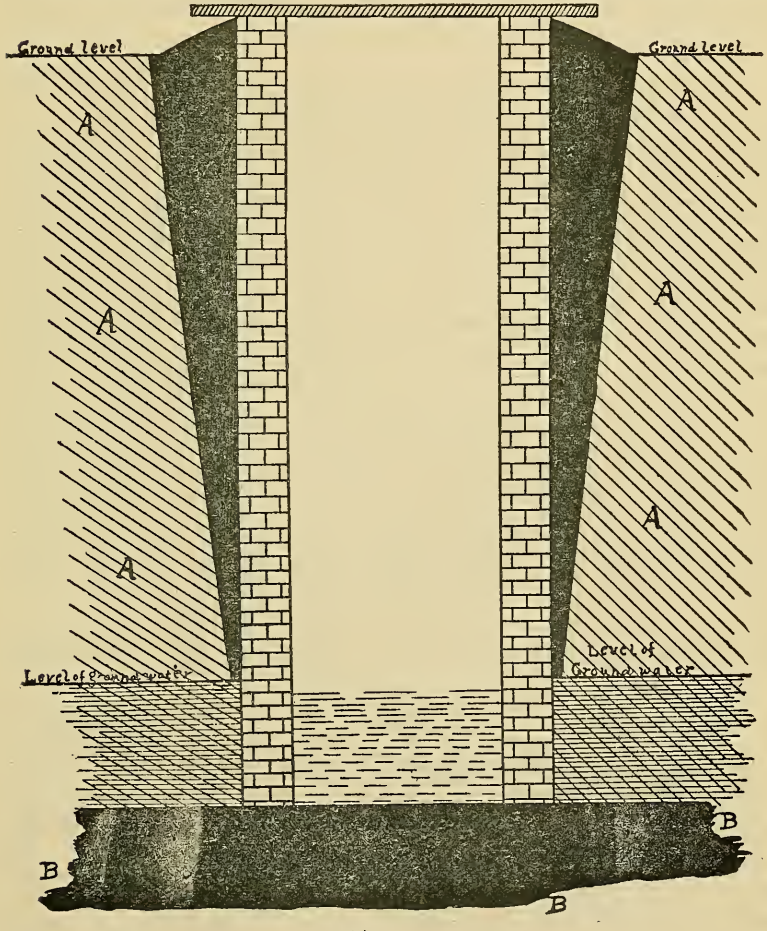


FIG. 4.

A—porous strata, such as sand, gravel, loam, shale, etc. B—impervious stratum, such as clay, rock without flaws, etc.

The accompanying diagram will serve to explain what is meant. By this construction surface water is prevented, by the impermeable clay backing, from getting entrance to the well until it has percolated through the earth to the line of level of the ground-water.

It will be quite clear that no one of the wells in Fig. 3 can be free from unfiltered, and consequently dangerous water, unless this precaution is taken, since even those which reach the ground-water may be polluted by the soakage of unfiltered surface water.

If now we study the gathering ground 1 to 2 in Fig. 3, we have a wild, rocky, and probably unsettled tract of land, free from animal impurity, and comparatively free from vegetable decay. Moreover, its distance from the point, at which the water collected on it is used (W^5), ensures thorough filtration, and we can see at once why the water of this deep stratum should be eminently pure and wholesome. Such water is, for obvious reasons, apt to contain more mineral matter in solution, and may even conform to the type of a true mineral water. Unless this be the case, it is evidently a very desirable domestic supply, and wells like W^5 are always to be preferred when attainable. Even these, however, must be protected against soakage contamination, to which they are just as liable as those of any other type. This study has shown us that shallow wells, obtaining as they do, their supply from unfiltered soakage can never be safe for domestic use, although favorable circumstances may prevent them from becoming actively disease-producing ; that ground-water wells, if properly protected from local contamination by soakage, are generally safe ; while deep water wells, guarded from local soakage, are safest of all.

It has seemed to me desirable, and even necessary to say what I have, by way of introduction to the special phase of this subject, to which I now ask your attention. Large towns and cities, as a rule, obtain their water supplies from some single source, a river, lake or spring, so that each family in a city of, say 5,000 families, is supplied with water of the same kind as the rest. It consequently becomes a matter of small cost to each family, to take care of this common source of supply, to have it examined from time to time, chemically and otherwise. Moreover, their is generally a Board of Water Commissioners ap-

pointed to look after the matter, and an engineer, whose special duty it is to see to the protection of the supply, and its proper distribution. Compare this with the case of 5,000 families resident in the country. It is probable that these obtain their water supply from 5,000 different wells, each having its own peculiarities of situation and protection, and each well having a special interest, only to the particular family drawing water from it. If the owner of one of these wells desires to have it examined with a view to determining its purity, the total cost of such examination falls upon himself, and any opinion procured by him, has no value for his neighbors, and does not help them to a conclusion as to the safety or otherwise of their wells; yet it should be a matter of great importance to each of them to know that, not only his own, but his neighbor's well is pure. If one well become polluted with typhoid germs, for example, this disease may spread over the whole neighborhood, as has happened again and again. If a school well, or the well of a resident near a school or church, and likely, on that account to be visited by many people, becomes infected with typhoid, or diphtheria, or cholera, or other germs, it may become a prolific source of the disease. I have often asked myself this question: "Can no way be devised whereby useful information, regarding the safety of country wells can be obtained, which will be comparatively inexpensive, and therefore practicable?" No answer is forthcoming that fully satisfies all requirements; but I believe that the suggestion I am about to make, goes some way towards solving the difficulty and is, at least, worth serious attention.

In the first place, we may conclude that normal ground-water is a safe source of supply. Owing, however, to the fact, that the soil and sub-soil of one locality differs from that of another locality in nature of constituent materials, their depth, compactness or porosity; contiguity to neighboring heights, of land, or to swamp; as well as in amount of annual rainfall, we cannot expect ground-water to have the same characters everywhere. What we may expect is that in a given geological and topographical area (perhaps extending over many square miles, perhaps less than one square mile in size), the ground-water will have a certain definite character. If the soil consist largely of limestone *debris*, we shall find bi-carbonate of lime in the water, if gypsum characterize the soil of the locality, we shall find sulphate of lime in the water, if chlorides be present in the soil, then

chlorides will be found in the water, and so on. In a neighboring area, separated, say, by a ridge of granite from the first, and having a soil resulting chiefly from the weathering and disintegration of granite, we shall find a ground-water much softer than the first, and having small quantities of silicates, and other products of the disintegration of granite in solution. Now all the wells, and there may be hundreds of them, which are dug into this ground-water, will fall into a class by themselves, and exhibit common characters, provided that local soakage is prevented and the water they contain be the uncontaminated ground-water of that region. How then will an individual well be affected, in whose case sewage finds entrance? Organic matter will increase, and especially will this be true of nitrogenous organic matter; phosphates and chlorides will be increased, nitrates and nitrites may be found in it, and a bacteriological examination may reveal the presence of new forms of microbial life. To determine all this, a full analysis is of course needed. What I propose to do, is to confine attention to some one characteristic, and to select that one which is most surely altered by the entrance of sewage, and is at the same time most easily and certainly determined. This I find to be the *Chlorine in Chlorides.*

The determination of chlorine, in chlorides, is one of the simplest and most definite estimations that a chemist can be called upon to make. Owing to the presence of common salt (chloride of sodium) in human food, and its use by domestic animals, it is always found in sewage, so that any notable admixture of sewage with a well water, at once raises the chlorine precentage.

Chlorine is, however, invariably present in normal ground-water, and the question arises for each region; "How much chlorine is normally present in the ground-water of this locality?" Of course the answer can only be given after analysis of normal samples, but once it is known, any marked variation from that standard, stamps a well of that region as suspicious, and justifies discontinuance of its use until fuller examination can be made. It must not, however, be forgotten that contiguous wells, like W^2 and W_5 in Fig. 3, may obtain their water from entirely different sources, so that it becomes necessary to take depth, and other factors into consideration. For the lower or second water bearing stratum may have a very different normal content of chlorine from the first or ground-water proper; but its number

will also be a fixed one, and if once known, it will be as easy to detect any sewage contamination in this kind of well as in the other.

It is also to be noted that the normal chlorine number for a given area, will vary from month to month, and will be especially affected by unusually heavy rainfall, or by prolonged drought. But experience shows that variations, due to these causes, are insignificant in comparison with those resulting from sewage contamination.

For some years past I have endeavored to put this method to the test of experiment, and for that purpose I have collected personally and by deputy, over 730 samples of well water, chiefly within the drainage area of the Ottawa valley. The difficulties which lie in the way of any single individual's accomplishment of so gigantic a task as this, are almost insurmountable ; and I can only hope to illustrate the subject in a very imperfect way from the data in my possession. The first difficulty is to obtain samples which truly represent the normal ground-water, and the normal deep water supply or supplies. Very few country wells are protected against surface soakage by the method indicated in Fig.4, and I may say here, that I think the Provincial governments might profitably entrust to certain of their officials whose work takes them to different parts of the country, as in the case of the Road Inspectors, the Board of Health officers, etc., the additional duty of seeing that new wells are properly protected from surface drainage. It costs very little more to properly protect the well by tamping clay behind the stones when the well is being made, than to finish it in the unscientific way in which we find this important matter usually performed, and I am sure that it is ignorance rather than any wish to save a few dollars at the risk of health, which explains the unsatisfactory condition of nearly all the wells which I have visited.

If, in each topographical area, we could find a few thoroughly protected wells, of known depths, and of whose history a full record had been kept, we should possess the data which we require, and which we cannot now obtain with any such certainty as would give a sure basis for the illustration of the scheme I have suggested.

It is by so much the more important that new wells should be constructed in such a way as to fulfil these conditions.

On the 13th October, of last year, I personally visited 43 wells, chiefly on farms, in the district between Kinburn and Packenham, in the County of Lanark. This is an extensive clay region, fairly level, except quite near Packenham, where the land dips towards the Mississippi river. The Mississippi rises in a series of small lakes, about 80 miles west of Packenham, in the townships of Abingdon, Barrie and Clarendon, in Addington County. These townships are very thinly settled, and the whole course of the river is through a region but little affected by human habitation. With the exception of the towns of Perth and Almonte, it may be said to be quite as nature left it, and a purer gathering ground could not be wished. This is proved by the fact that a sample of the river water taken at Packenham gave only two parts of chlorine per million. No doubt, this small content of chlorine is chiefly derived from sewage for, although the organic matter of sewage may change by oxidation as already explained, the chlorine remains, to tell the tale of past sewage pollution. In the case before us, the amount is too small to give any concern for the purity of the river water—No doubt there are points on the river, (e. g. just below the town of Perth,) where locally, a higher chlorine figure would be found, pointing to local and serious sewage contamination. But the volume of the river is so large, that by the time the sewage has distributed itself uniformly throughout it, the figure 2 per million, for chlorine, has been reached, and the organic impurities have been fully oxidized.

The following numbers were obtained for seven wells in the region referred to ; the wells having a depth of less than 10 feet, and being of the kind called surface wells.

WELL	DEPTH	CHLORINE PER MILLION
1	9 ft.	4
2	9 "	10
3	9 "	22
4	10 "	22
5	8 "	26
6	7 "	32
7	8 "	180

Why are these numbers so much higher than the river water gave ? There is but one answer :—the wells are dug in soil which is more or less saturated with sewage. Not one of these wells, so far as I could learn, was protected by a clay backing, (see Fig.

4) from soakage, and consequently, most of them are contaminated with sewage which has undergone no such amelioration by soil-filtration as would have resulted from proper construction. Not one of them is certainly a safe well ; while No. 7 cannot but be a most dangerous supply.

In the following table I have placed the resulting numbers from examination of 21 wells—varying from 10 to 20 feet in depth : These samples were taken on the same day, and from the same region :

WELL	DEPTH	CHLORINE
1	20	4
2	12	4
3	16	4
4	18	6
5	18	14
6	15	16
7	12	22
8	15	24
9	13	32
10	14	32
11	12	44
12	17	48
13	20	54
14	17	88
15	12	90
16	13	92
17	13	98
18	12	114
19	18	128
20	18	194
21	12	370

It is quite likely that most of these wells derive the main portion of their supply from the ground water of the locality ! but it is very certain that most of them are contaminated with soakage water. The first four are among the deepest of these wells, and as likely to be true ground water wells as any ; yet their chlorine content is not high—in fact, the very highest chlorine numbers in this list correspond to decidedly shallow wells, whose contamination by sewage is beyond a doubt.

The following six wells, are decidedly *deep wells*, and should give pure water, were they properly protected from soakage.

This they are not, however, and I cannot feel sure that the chlorine they contain is not, at least in part, due to sewage.

DEEP WELL	DEPTH	CHLORINE
1	25	24
2	35	56
3	46	58 (in rock)
4	25	170
5	25	195
6	25	240

Two wells in this region answer to the type of mineral springs. They contain respectively 3775 and 3700 parts of chlorine per million. It is quite evident that this chlorine has a mineral, and not a sewage, origin, and I mention them to show how marked a distinction exists between such wells, and the ordinary domestic well.

Later in October, I collected, partly in person, and partly by deputy, seventy samples of well-waters along the Montreal road, through the villages of St. Joseph, Blackburn and Cyrville, and the adjacent country. Of the wells less than 10 feet deep, eight contained less than eight parts chlorine per million and 13 others gave chlorine varying from 16 to 250 parts, six wells yielding more than 100 parts per million. Most of these wells were so evidently unprotected that I was prepared to find them dangerously contaminated, as the result shewed them to be.

Of 31 wells having a depth between 10 and 20 feet, only two gave less than 10 parts of chlorine; 14 gave more than 100 parts, and 5 more than 200. There can be no doubt whatever that most of this chlorine has a sewage origin.

Of the deep wells, the following is the record:

DEEP WELLS	DEPTH	CHLORINE
1	?	2
2	21	6
3	26	26
4	30	52
5	96	52
6	22	86
7	?	110
8	27	280
9	23	670
10	155	860

It is noteworthy that the increase in chlorine corresponds to an increase in depth, if we omit numbers 6, 8 and 9 in this list. No. 6 is in a hotel yard, and the well is not properly protected—No. 8 is 25 years old, has no pump, and shows every sign of neglect in its surroundings, and No. 9 is 18 years old, not protected from soakage, and dug in soil which has been used as a garden and otherwise from immemorable time.

I have made, at different times, similar collections of well-water samples near Peterboro, near Hamilton, and at several places nearer Ottawa. The analytical data have a special interest for the neighborhood in question ; but for such a general study as we are now making, it seems scarcely worth while to quote them. They emphasize the point to which I have already drawn your attention, viz.—the difficulty of ascertaining the true chlorine value of normal ground-water. If any considerable number of properly protected wells existed in a given locality, there would be no difficulty about this matter, or at least, the difficulty would be much lessened. A moment's thought will shew you why I speak so guardedly. The chlorine of sewage persists, even after the dangerous character of the sewage has disappeared ; so that a properly protected well, dug in a soil which is saturated with sewage, may contain water which is safe in domestic use, for, although it contain the chlorine which the sewage contained, the truly dangerous organic matter of the sewage has been destroyed by soil filtration, and is now harmless. The chlorine now points to "past sewage pollution." I think that most of us would prefer that the sewage pollution of the water we drink should be a long time past. I am only mentioning this feature of protected wells here for the purpose of pointing out that the chlorine number of such a well may be much higher than that of the normal ground-water of the locality, and that it would be unsafe to deduce the normal number from it. It is quite true that two wells may be dug side b side, and their water give the same chlorine number, yet one of them may be safe and the other unsafe in use. This only shews that a final decision must not be reached from the consideration of any single feature ; but that the history of the well should be studied as fully as possible. Every farmer who digs his own well must be in possession of the needed facts ; and the person who uses a well, with whose history and character he is unacquainted, is as foolish as he would be who should pick up a

bottle having no label, and drink its contents, in full reliance upon the watchful care of an over-ruling Providence.

Finally, I think that the care of wells should devolve upon their owners; but I believe that individual owners would find it economical and satisfactory to place this trust in the hands of specially appointed Township or County Officers ; and I consider it to be the duty of Provincial Governments to take the initiative in bringing to the notice of the public generally, the immense importance of this much-neglected subject—the care of wells.

LOCAL DEFLECTION OF THE PLUMB LINE.

Otto J. Klotz.

In the present short paper it is only intended to lay before the Society certain data of the deflection of the plumb line as found by latitude observations and azimuth surveys along the International Boundary, 49th parallel, from the Lake of the Woods to the Pacific Ocean. Those westward, as far as the Rocky Mountains, were published years ago in the United States Report of the Northern Boundary Survey, but those of British Columbia have, to my knowledge, never been published. The effect of deflection of the plumb line on longitude and azimuth observations is not considered in the present paper.

Deflection of the plumb line may be defined as the deviation of the vertical at any point from the normal at that point to the surface of an assumed figure of the earth. In dealing with the earth, we must assume its shape to be of some definite geometrical form and of certain dimensions, for only then can observations, at different points thereon, be correlated and adjusted. The best assumed form (Clarke's 1880 spheroid at present), however, differs at places widely from the actual form or geoid. To illustrate, if the continents were traversed by narrow canals, communicating with the ocean, their surface, although level, would be wavy or undulating, and would be in some places above, in other places below the surface of the spheroid or ellipsoid of revolution, the divergence of the two surfaces being probably confined to a few hundred feet.

The position assumed by the plumb line, is due to the law of gravitation, that is, it is the integrated result of the attraction of the individual particles, composing the mass of the earth, and hence the position is affected by the relative distribution of them. We may, therefore, say that the unsymmetrical distribution of the particles, whether on the surface, as mountains, etc., or in the thin crust, is the cause of the deflection of the plumb line

from its theoretical position. The ablest mathematicians have been engaged, ever since the era of precise measurement, upon this difficult question of the form and dimensions of the sea level surface.

In some instances we are quite prepared to find local deflections of the plumb line, for example, when observations are taken on the plains at a point near a more or less isolated upheaval, as the Three Buttes or Sweet Grass Hills in Montana, just south of the International Boundary. These hills, as we shall see later, pulled the 49th parallel out of its theoretical position about 800 feet. On the other hand, large deflections show themselves without any visible reason or cause as evolves from numerous observations and their geodetic connection. A remarkable instance is that of the comparatively plain area surrounding Moscow, which I visited recently, where, on the margins of an 18 mile east and west zone, large deflections of opposite signs were found. From this it must be concluded that there exists beneath the surface a cavity or at least matter of small density.

It is evident, therefore, that the observations alone, at any particular point, are not conclusive for fixing its geographical position upon the surface of the earth, but that numerous astronomically determined points must be connected linearly by triangulation, and from their inter-accordance, or discordance, the most probable values determined, based upon an assumed figure of the earth.

In our own city here, there appears, due to the topographical configuration, to be a deflection of the plumb line; for, the latitude determinations made by me at the observatory on the summit of the escarpment, compared with those made some years ago by Mr. Lindsay Russell on the opposite side of the river, show a discrepancy of about a second of arc, equal to about a hundred feet, a quantity greater than the error of observation. However, a more or less extended hypsometric survey would be necessary for a plausible *a priori* conclusion with reference to the probable discordance in latitude to be expected between two stations.

All observations for the determinations of positions upon the earth depend upon the direction of the vertical. Latitude and

longitude observations, the surveyors' and engineers' operations, all have their zero of reckoning in the centre of the level bubble, and any displacement of the latter, which is equivalent to the displacement of the plumb line, affects the results, and will show discordances when widely separated observations are geodetically connected.

It may be stated that a delicate level used for latitude work, reading to a second of arc, has usually a radius of about 1,700 feet, or nearly a third of a mile, for the curve ground on its inner upper surface.

To digress for a moment.

Boundary lines may be divided into three classes :—those representing a social unity, those representing a physical unity, and those representing a political unity. Those of the first find the largest number of representatives in the older settled countries, for the primal concept of boundary was to conserve the social unity. It was not to define territorial extent as much as to define or assert the domain of a like people ; like by language, race, or religion or other affiliation. Such boundaries are, as a rule, very irregular and difficult to describe. When the social organism reached that development that written treaties became necessary between adjoining peoples, the description of the separating boundary was made from the boundary *de facto*, and the boundary not laid down from the description.

The second class we may consider an expansion of the first, resulting from conquest, whereby a physical as well as a social unity was to be preserved. Of the physical boundaries,—mountains, rivers and lakes,—to serve the purpose of barriers, by mountains, that end is undoubtedly best attained. Europe furnishes a number of examples of this.

The third class, which we may call the astronomic boundary, is a development of recent times, and applies invariably to areas practically unsettled, unsurveyed and little known. Such can be laid down on paper, or described in treaties without scarcely any knowledge of the country whatsoever.

While Europe furnishes the most examples of the first, America does so of the last. Many of the State boundaries of the United States are astronomic lines, either meridians, parallels,

or lines of definite azimuth. Similarly with the subdivision of Australia and recent boundaries in Africa. Astronomic boundaries may generally be taken as an index of the ignorance existing of the country or area involved and its resources.

Boundaries under the first division are difficult for definition or restoration when such is necessary. Those of the second, always dependent upon water, are generally self evident, while those of the third are comparatively easy of determination.

There are instances of a fourth class of boundaries—where the position of it is dependent upon the position of a physical feature,—e. g. that it be at or within a given distance from a river or the sea.

A notable case of the last is that of south-eastern Alaska, as described in Article 4 of the Convention of February 28th, 1825. Such boundaries are exceedingly difficult to lay down on the ground, requiring, too, beforehand laborious mathematical calculations. The Railway Belt of British Columbia, extending twenty miles on each side of the Canadian Pacific Railway gave the writer an example of such computation.

A river, and least of all a large river, a commercial artery, forms an undesirable international boundary. The very nature thereof makes it a route of travel, and hence of settlement on its banks, which, if in possession of two countries, is almost sure to lead to trouble. Hence we find few or no large rivers forming such boundaries, although our own St. Lawrence does for a short distance separate us from our southern neighbor. A summit or watershed boundary is pretty satisfactory, if restricted to mountains, but when applied to plains or undulating country, is fraught with difficulties. The difficulty consists in establishing the line of watershed, as was presented in the Maine-New Brunswick controversy early in the century.

Of the several classes of boundaries spoken of, none is as immutable as the astronomic one. Of the first, the original monuments and records may disappear, and personal evidence be wanting. Of the second or physical boundary, time may bring about changes quite marked and cause the line to move therewith. As a well-known instance, the Mississippi may be cited. In a recent report of the "Idaho and Montana Boundary Line"

we have another illustration. It is stated that: "from a geological standpoint, but hardly from a practical one, however, there is another reason why monuments should not be placed on the summit of the Bitter Root range, as marking the boundary line between Idaho and Montana. There is abundant evidence that the summit is what is known as a retreating or migrating divide; in other words, the waters tributary to the Bitter Root River in Montana are continually capturing by erosion those of the Clearwater river in Idaho, so that the divide is slowly being shifted to the westward, thus adding to the territory of Montana and diminishing that of Idaho. The existing divide is uniformly from six to eight miles from the irregular line representing the original divide, if the latter may be accepted as having passed through the highest points of the range, which seems probable."

When a boundary is defined by a parallel of latitude, the question invariably arises, in the demarcation of it, whether the astronomic or mean parallel is to be adopted. The astronomic parallel is that line on the surface of the earth on which direct observations for latitude give the same elevation of the pole; geometrically, for the spheroid or ellipsoid of revolution, it is the intersection of the cone, having its apex in the minor axis of the earth and making an angle therewith equal to the complement of the latitude, with the surface of the earth. Principally owing to the local deflection of the plumb line, points astronomically determined in latitude will not "close," that is, the line projected or run from one station as a parallel will not meet the next point or astronomic station.

That line with reference to which the sum of the discrepancies north is equal to the sum of those south is the mean parallel.

However, as the latter can only be determined *after* the location and connection of the astronomic points, entailing revision of the whole work, and besides the difficulty of re-establishing points on the mean parallel in case of loss or disappearance of monuments and marks, it has generally been decided to adhere to the simpler and more readily established astronomic parallel. All such parallels traced upon the earth are irregular curves.

The International Boundary Line, between the Lake of the Woods and the Rocky (Stony) Mountains is defined in the second

article of the Convention of 1818 as being the parallel of 49 degrees north latitude. The immediate cause of the delimitation of the boundary was the discovery that the fort of the Hudson's Bay Company at Pembina was nearly a mile within United States territory.

The field work was begun in September 1872 and finished in the same month two years later, while the proceedings of the joint commission were brought to a conclusion May 29th, 1876.

On this line of 860 miles, 40 astronomic stations were established, and 388 monuments erected.

After due consideration, the commissioners agreed upon the astronomic parallel. The recommendation for this, by the chief astronomers of the commission, was based on the following grounds: "1st That the portion of the parallel of 49° included within the operations of the commission, being only about one twentieth of the entire circle of latitude, was not sufficient to fix, with any mathematical accuracy, the true position of the mean line of 49°, and that, therefore, if such a parallel were described, depending on the mean of the astronomic stations, no known point of the boundary would be in latitude 49°; 2nd That as the amplitude of the arcs, included between the mean and the astronomical parallels, would in many cases be very considerable, grave errors and complications might arise in the subsequent re-survey of any lost portion of the boundary; 3rd That the definition of a mean line would involve a re-adjustment of the whole boundary, after the first careful survey should have been completed, and consequently a very considerable increase of expense, without any practical benefit accruing; 4th That for every purpose except that of geodetic computation, a parallel of points determined astronomically (instrumental errors aside), is a true parallel of latitude, and therefore, fulfils the stipulations of the treaty under which the joint commission was organized."

Accordingly, astronomic positions were determined at approximate intervals of twenty miles. These stations were connected by tracing upon the ground tangents to the prime vertical circles at each successive point. From these tangents, checked and corrected for errors of azimuth, the calculated offsets to the small circle of latitude were measured at convenient intervals,

varying from one to three miles. From the last mentioned offset the relative station error (deflection of plumb line) was found and distributed between the two stations in the ratio of the distances where offsets were taken. From this method it results that the boundary line, as actually traced, is an irregular curve, affected at each astronomical point by instrumental errors and by the local deflection of the plumb line, making the closest probable approximation, at every point, to a true astronomical parallel.

Of the forty astronomical stations on the 49th parallel, four were observed jointly, seventeen by the United States astronomer and nineteen by the British. The mean of the probable errors of the British stations was $\pm''.088$ and of the United States $\pm''.059$. The average of the probable errors is then a little over seven feet.

The greatest difference of station errors is $13.''89$ or 1,407 feet, being in a distance of 97 7/10 miles, between the Cypress Hills to the north of the boundary, and the Three Buttes or Sweet Grass Hills near, and to the south of the 49th parallel. The station error of the former is $+ 5.''94$, of the latter $- 7.''95$, that is the Three Buttes pulled the 49th parallel 805 feet south, and the Cypress Hills 602 feet north of the mean parallel. The greatest discrepancy between adjacent stations, about twenty miles apart, is $7.''28$ or 738 feet, near the Three Buttes.

Looking at the accompanying diagram, in which the upper figure is a representation (much exaggerated) of the relative position of the astronomic and mean parallels, while the lower figure shows the main features of the topography for a distance of about thirty-five miles on each side of the boundary line, the large deflections appear obvious from the topography. From the Lake of the Woods, westward, into the valley of the Red River, the station errors increase, and for a reason, which from our lack of knowledge of the underlying strata, must be conjectural. The escarpment of the Pembina Mountains, (elevation would be a more appropriate term, height 1,695 feet), naturally draws the vertical southward, continuing to do so until the Turtle Mountains (of moderate elevation, 2,550 feet) are reached, which too deflect to the south. After entering the Côteau of the Missouri we pass along the southern base of the high ridge, separating the waters flowing into the Gulf of Mexico, from those flowing into Hudson's Bay, and find, naturally, a deflection to the north, increasing to a

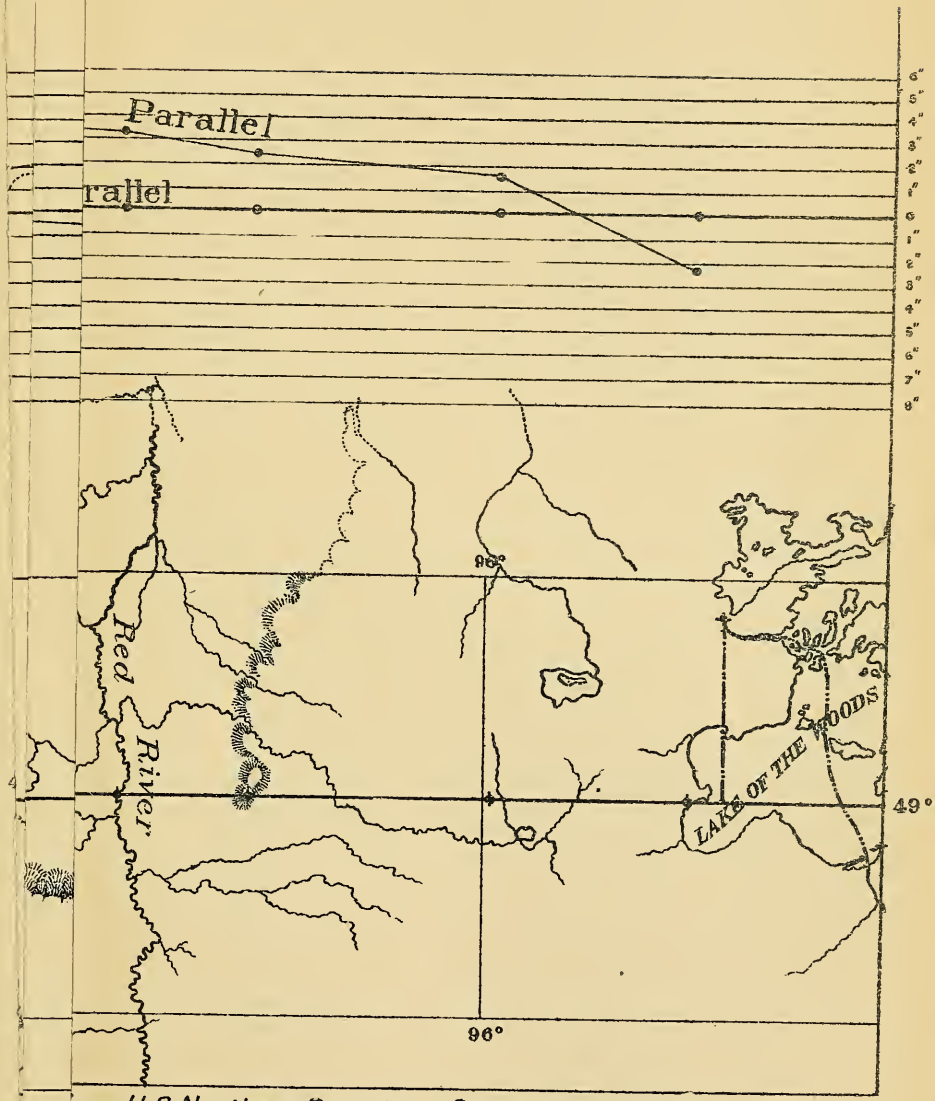
maximum, south of the Cypress Hills (3,800 feet). Here the enormous intrusive masses of the Three Buttes, produce a violent disturbing effect, drawing the astronomical parallel to the south, at an average rate of 14 feet to a mile, for a distance of about one hundred miles. When we actually enter the tumultuous Rocky Mountains, with all their varied conditions of compositions, of faults and dykes, and our lack of hypsometric maps, we are unable to even make a plausible estimate in which direction the local deflection is to be expected. Even the relative deflection between adjacent stations remains unknown in most cases on account of the great difficulty in connecting them geodetically.

As a very remarkable example of the deflection of the plumb line may be mentioned, the one on the arc of the meridian between Andrate and Mondivi, in northern Italy, where in a distance of a little over seventy-seven miles, a difference of nearly forty-one seconds was found, that is to say the difference in the distance between those two terminal points determined by direct astronomic observation, and also linearly by triangulation was found to be about four tenths of a mile. How much of this quantity is attributable to each place for local deflection, and again how much is due to relief or topography, and how much to the unequal distribution of masses beneath the surface of the earth, is not known.

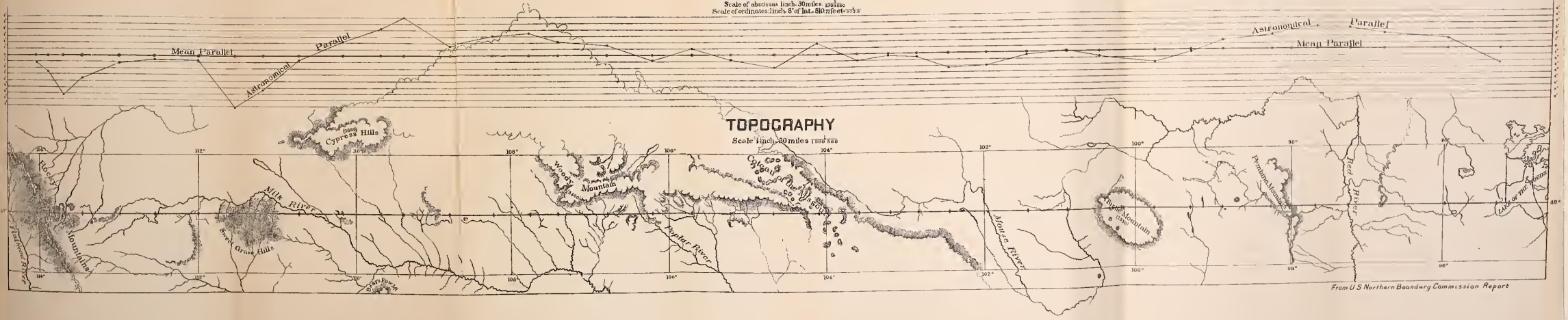
It is evident that observations at two places which are also geodetically connected, can only give the relative deflection of the plumb line.

For the boundary between the Lake of the Woods to the summit of the Rocky Mountains, the Commissioners agreed that the line joining any two adjacent monuments shall be an arc of the parallel. This was to apply, too, in the case of restoring any monument whose position was lost. This agreement differs from that of the boundary commissioners, who had charge, some 17 years previously of defining the boundary from the Gulf of Georgia to the summit of the Rocky Mountains. They agreed that the connecting line between monuments shall be a straight or direct line, i.e. an arc of a great circle.

The international boundary commission appointed to define the boundary under the first article of the Treaty of June 15th, 1846, (the present southern boundary of British Columbia) was



rom U.S. Northern Boundary Commission Report.


Scale of abscissas 1 inch = 30 miles = 1/1900800
Scale of ordinates 1 inch = 8' of lat. = 810 7/10 feet = 1/375
Mean Parallel
Astronomical Parallel
Astronomical Parallel
Mean Parallel
TOPOGRAPHY
Scale 1 inch = 30 miles 1/1900800
Cypress Hills
Rocky Mountains
Milk River
Sweet Grass Hills
Wood Mountain
Cypress Hills
Missouri
Porcupine Mountains
Turtle Mountain
Pembina Mountains
Red River
Lake of the Woods
Mouse River
Poplar River
Turtle River
From U.S. Northern Boundary Commission Report

organized in 1858 (first meeting August 13th), and in the summer of the same year began the field work at the western terminus of the boundary. The observations and surveys were carried eastward under great difficulties, owing to the heavy forest and mountainous character of much of the country. Early in 1862 the field work was completed and the preparation of the maps begun, which were, however, not completed and jointly signed by the commissioners till 7th May, 1869. A report was never published.

Between the extreme east and west points, upon the watershed of the Rocky Mountains, and the eastern shore of the channel which separates the continent of North America from Vancouver Island in west longitude 114° 03′ 34″ and 123° 3′ 53″ respectively, the exact length of the boundary line upon the 49th parallel of north latitude is 409 4/10 miles. The position of the parallel was determined by 28 astronomical stations, 11 of which were established by the British Commission, 14 by the American Commission, and 3 were observed by both. Another station was fixed by the British Commission at Schweltza Lake, but it was at the time rejected on account of the apparently large deflection of the plumb line, though the after experience of the most accurate instrumental observations in that mountainous country, led to the conclusion that the result at Schweltza was quite as trustworthy as any of the others. It is, however, not included in the final determinations.

At the first meeting of the Commissioners at Semiahmoo, Aug. 13, 1858, it was concluded, after discussing plans for determining and marking the line as far as the Cascade Mountains, to be inexpedient at that time, in consequence of the great expense, consumption of time, and the impracticable nature of the country, to mark the whole boundary by cutting a track through the dense forest. It was therefore agreed to ascertain points on the line by the determination of astronomical points at convenient intervals on or near the boundary ; and to mark such astronomical stations or points fixed on the parallel forming the boundary, by cutting a track of not less than 20 feet in width on each side for the distance of half a mile or more, according to circumstance. Further, that the boundary be determined and similarly marked where it crosses streams of any size, permanent

trails, or any striking natural features of the country. In the vicinity of settlements, the line was to be cut a greater distance. Bessel's value of the figure of the earth was adopted.

From the two points on the parallel, dependent, respectively, on the Sumass and Schweltza astronomical stations, cuttings were made to connect the points. When the cuttings met, there was found to be a discrepancy of 8″, say about 810 feet; they were, however, connected, though the line thus defined is obviously not strictly *the* boundary of the treaty. The distance is about 9¼ miles. This relative deflection of the plumb line, 8″, in so short a distance, is the largest on the whole 49th parallel, from the Lake of the Woods to the Pacific. When the cuttings on the parallel from Sumass and the British station at Semiahmoo met, there was a discrepancy of 114 feet in the twenty miles, and between the U. S. astronomical station at the east shore of Semiahmoo Bay, and the British one five miles east thereof, a discrepancy on the parallel of nearly nine feet was found, an error quite within the error of observation.

The only other cutting on the whole boundary line west of the Rocky Mountains, connecting adjacent astronomic stations is between the Similkameen and the Columbia rivers, a distance of 96 miles. The stations there in order eastward are: Similkameen (U.S.); Lake Osoyoos (Br.); 1st Crossing Newhoilapitkw (U.S.); 2nd Crossing Inshwointum (Br.); 3rd Crossing Statapoosten (U.S.); and on the Columbia (Br. and U.S.) From the point on the parallel at Lake Osoyoos, a line was run east and west 30 1/5 miles, connecting with similar points at Similkameen and at the 1st Crossing. The line was found to strike 509 feet north of the former point and north of the latter 364 feet, showing a marked deflection of the plumb line. When, similarly, an east and west line was run from a point on the parallel at Inshwointum, it was found to be south 300 feet of the point on the parallel at the 1st crossing, and 180 feet north of the point at Statapoosten.

This shows, therefore, a discrepancy between the latitude of Lake Osoyoos (Br.) and Statapoosten (U.S.) of 844 feet, due to local attraction or difference of local attraction. After verifying the accuracy of the latitude observations, it was decided to adopt the mean parallel, based on the differences found, between Similkameen and Statapoosten—a distance of 71 miles. This is the

only part of the whole boundry line between the Lake of the Woods and the gulf of Georgia, where a mean parallel has been adopted for the boundary, instead of the astronomic parallel. These seventy-one miles were re-cut on the mean parallel. From the extremity of the mean parallel at Statapoosten, an east line was run to the Columbia, where a difference of 212 feet was found between the mean of the British and United States latitude determinations there and the mean parallel. The line (for final boundary) was thereupon deflected from Statapoosten so as to strike the above mean Columbia position of the 49th parallel.

The actual definition of the boundary is as follows: Its western extremity is marked by a substantial granite obelisk in longitude 123° 03′ 53″, west, standing upon a steep cliff on the western face of the promintory of Point Roberts, about 160 feet above the sea. For 44.8 miles eastward there are 42 iron pillars placed at suitable points on the boundary. One pillar stands on the eastern face of Point Roberts, 2 miles 704 yards from the obelisk, and there are two intermediate pillars in the interval at average distances apart of somewhat more than ¾ mile. A pillar on the west shore of Semiahmoo Bay is 12 miles 1,177 yds. from that on Point Roberts on the opposite side of the bay; and thence in 29¾ miles to the eastermost pillar the average distance apart is about 1380 yds., varying between 1 mile 1245 yds. and 198 yds. on the opposite bank of the Sumass River. These pillars all stand in a continuous cutting through the forest or in intervening patches of swamp and prairie. From the eastern-most iron pillar, to the right or west bank of the Similkameen river is 107.9 miles, the boundary is defined in the vicinity of 9 astronomical stations by 19 cairns or pyramids built of dry stones, and one bench mark cut on the face of a rock at Ensakwatch; and at several stations short vistas were also cut in the forest, between the cairns. This wide interval comprises the rugged and inhospitable region of the Cascade Mountains. One of the widest unmarked intervals on the boundary occurs in these mountains, between Pasayten and Naisnulch, the distance between the marked points being 23.7 miles. From a cairn at the foot of the mountains on the west side of the Similkameen river to the east or left bank of the Columbia, the boundary for 95 miles is well and continuously marked by 69 stone cairns and one mound of earth, and by forest cutting in all necessary cases.

This was the most favorable portion of the work, part of the line passing over rolling prairie country interspersed with wood ; but very considerable portions were also mountainous, rugged and heavily timbered, though more accessible from the valley of the Newhoialpitkw (Kettle) river than were the Cascade Mountains. Two cairns stand within 129 yards of each other on the east bank of the Columbia (one having been placed by each Commission) and the average distance apart of the remainder is 1 mile 679 yds. From the hill tops the line of boundary defined by cairns and cuttings can be traced for many miles. For the remaining 161.8 miles between the eastern cairn on the left bank of the Columbia river and the terminal point on the watershed of the Rocky Mountains in west longitude 114° 03′ 28″, the boundary passes over successive mountain ranges intersected only by the valley of the Kootenay River at two points 75¾ miles apart and by the adjacent valleys of the Flathead river and its tributary Kishenehu creek. This portion of the line is marked in the vicinity of 9 astronomical stations, by 26 cairns and one bench mark cut in the face of the rock at the Kootenay Mountain Station, and by a cairn fixed by survey on the trail between Kootenay west and Mooyie station ; and the usual forest vistas were cut at the usual defined points, besides longer cuttings of 7 and 10 miles at the eastern crossing of the Kootenay, and between the Flathead and Kishenehu rivers. On the summit of the Rocky Mountains the monument consists of a pyramid of dry stones, situate on a narrow saddle with precipitous sides connecting two lofty mountains, serving to identify the locality between the Columbia and the Rocky Mountains, exclusive of the Mooyie trail cairn, and the intervals between the Kootenay mountain and Kootenay west stations, and Mooyie and Yahk stations, the distance between the consecutively marked points at the several astronomical stations averages about 13¼ miles ; but between the stations named they extend to 25 and 24 miles owing to the inaccessible nature of the intervening country which is quite as bad as the Cascade Mountains.

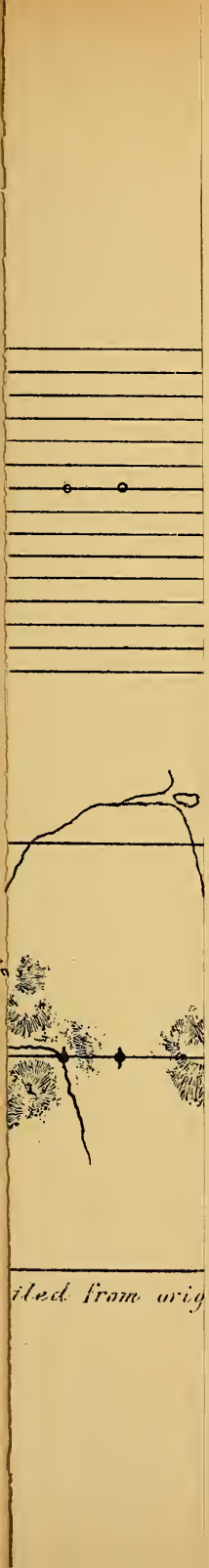
As already stated, the Boundary Commissioners had agreed to understand the boundary laid out by them, to consist of a series of straight lines between the successively marked points, without regard to the distances between those points or the curve

of the parallel in the longer intervals. That they did upon the consideration that it was of the greatest importance that nothing should be left for future discussion of settlement, and that the operations should be final and conclusive. It may be stated that opposite the centre of a chord of 25 miles in length, the departure from the 49th parallel would be about 40 yards, and of 12 miles, 9 yards. Both these departures are probably far smaller than the deflection of the plumb line, at the governing astronomical stations.

We have, therefore, in the actual boundary line of British Coulmbia, a deviation from the 49th parallel, as given in the treaty of 15th June, 1846, in so far, that the straight lines replace the curve of the parallel between all the stations, and furthermore, that between Similkameen and Statapoosten, the mean parallel was adopted instead of the astronomically determined points.

We have followed now the 49th parallel for 1,270 miles, about one thirteenth of its circumference, and it has disclosed to us some of its vagaries as manifested in the latitude component of the deflection of the plumb line. This boundary line is the longest astronomic one on the earth, the nearest approach to it being the meridian separating West Australia from North and South Australia.

The same law or force which causes the deflection of the plumb line, determines the length of the seconds pendulum, preserves the planets in their orbits, and maintains the stability of the universe—is the law of gravitation. Our earth furnishes us with many interesting problems, and the very discordances observed—apparent though they are—tend to lead us on to uuravelling the mysteries and intricacies of nature, and to unfolding the unity and harmony of the cosmos.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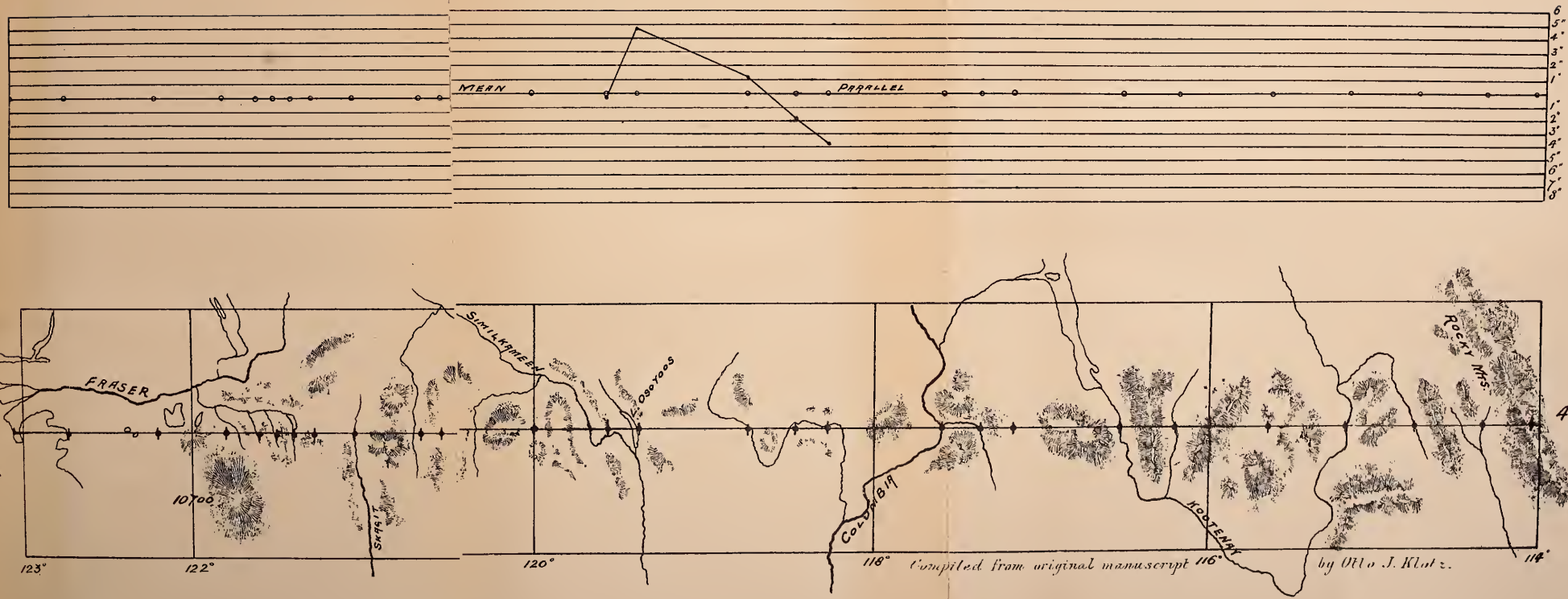
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SKAGIT
123°
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120°
118°
116°
114°
Compiled from original manuscript
by Otto J. Klotz.

FISH CULTURE IN CANADA.

By Professor E. E. Prince, Dominion Commissioner of Fisheries, Ottawa, President of the Society.

(Read March 23rd, 1900)

Fish-culture is, at once, one of the most ancient and one of the most modern of human pursuits. It is one of the most ancient, for the Chinese at a time so remote that it cannot be determined, are known to have reared fish, not only as quaint ornamental pets, but for use at table; and we know that the Greeks and Romans fully appreciated the utility of the artifical culture of fish. Lucullian feasts would have been impossible, but for the fish-pond's ample supplies. The ancients, says one authority, "were not satisfied with stocking fish-ponds which they had constructed for the purpose, but carried their foresight to the point of filling lakes, formed by nature, with the spawn of fish which they threw into them." (Columella, De Re Rustica Bk. viii., Sec. 16). In Christian times, fish-culture was not neglected and the mediæval monasteries were always provided with a fish-pond, ensuring suitable fare for Friday feasts. A fish-pond was regarded as necessary, no less than the buttery, the brewhouse, and the kitchen.

Protection of adult fish and systematic fattening were the main features of old-world fish-culture, but the Chinese as the French Jesuit, Jean Baptiste Duhalde, has recorded, procured the eggs of fishes, and cared for them in hatching tanks. The Romans, as we have seen, adopted the Chinaman's plan to some extent.

Modern fish-culture, to adopt a Hibernicism, has taken a great step in advance by taking the process a step further back, and by manipulation of the parent fish secures the ripe eggs, controls their fertilization, and incubation, and rears the fry, when hatched, to a more or less advanced stage of growth.

A French monk, Dom Pinchon, has been credited with first accomplishing, in the fifteenth century, the artificial fecundation of trout eggs; but competent authorities are of opinion that he simply collected naturally impregnated eggs. It was not until 1747 that a Westphalian officer, Lieut. Ludwig Jacobi experimented with the eggs of fishes, by actually mingling the milt and eggs, and carrying out fish-culture from the fecundation of the ova to somewhat advanced stages of the liberated fry or young brood. He reared trout until they were six months old, and founded modern fish-culture in the true sense of that term. The importance of his work was fully recognized, for his memoir was printed in Paris in 1770, and King George the Third, granted him a life pension in the following year. Karl Lund, in Sweden, followed close in the wake of Jacobi. In Italy, Rusconi (either in 1834 or 1835), and in Switzerland, Agassiz and Vogt, about 1836, minutely investigated the early stages of the eggs and young of fishes, while John Shaw, in the year of the Queen's Coronation, Knox, Young, Boccius, and others, from 1840 to 1850, added considerably to our knowledge of the larval development of the salmon and other species of fish. Rémy and Géhin, two French fishermen of La Bresse, appear to have practised fish culture in France in 1842, and the subject was brought to the attention of the public by the notable treatises of de Quatrefages and of Coste, the latter organizing in 1850, a large fish-breeding establishment with the authority of the Minister of Agriculture. France has ever since maintained a high place in the world of aquaculture.

It was not until 1853, so far as I can ascertain, that any attempt was made upon this continent to artificially breed fishes. Dr. Theodatus Garlick of Cleveland, Ohio, was the pioneer. He obtained parent brook-trout in Canada, taking them across from Port Stanley in Ontario, to his establishment in Ohio. He was an enthusiast, and his exhibits of young fish, hatched from Canadian trout-eggs, were a feature for many years at Agricultural Exhibitions in the various States bordering on the great lakes. Canada soon followed suit. The initial attempts were, of course, largely experimental. The late Mr. Samuel Wilmot claimed to have originated fish-culture in Canada ; but I find the claim to be disputed, and with justification, by a venerable

and respected citizen of Ottawa, Mr. Richard Nettle. Stimulated no doubt by recollections of famous streams in his native Devonshire Mr. Nettle, as early as 1856 or 1857, began the incubation of salmon and trout eggs for purposes of artificial stocking, in hatching tanks in the City of Quebec. He disputed the accuracy of the claim frequently put forward on behalf of Mr. Wilmot. The Bishop of Ottawa, (Dr. Hamilton) incidentally confirmed the claim of Mr. Nettle in a recent conversation, his lordship informing me that he himself saw the young fish and the hatching arrangements about the time referred to. Mr. Nettle was then Superintendent of Fisheries for Lower Canada. From a report by the late Mr. Wilmot, dated Dec. 31st, 1878, it appears that he commenced experiments in fish-hatching in 1865, eight or nine years later than Mr. Nettle's experiments, and he carried it on as a private enterprise until the Dominion Government took the work over and gave Mr. Wilmot an appointment as a Government official. In 1866 Mr. Wilmot acted as a fishery officer, with authority from the Government of Upper Canada, and on May 30th, 1868, he became an officer under the Department of Marine and Fisheries; but it was not until eight years later (1876) that he became Superintendent of Fish Breeding. For his initial experiments he was paid, in 1869, the sum of $2,000 by Order in Council.

Thus fish-culture in Canada, at first a private enterprise on a small scale, received a kind of semi-official sanction, but in 1868 it became distinctively a branch of the Dominion Government service, the Newcastle Hatchery, possessed by Mr. Wilmot, being transferred to the Department of Marine and Fisheries. This hatchery, Mr. Wilmot affirmed, in his report dated Feb. 3rd, 1875, "has been the nucleus from which all of the National and State fish-breeding establishments in Canada and the United States of America have taken their rise." Additional hatcheries were soon built, the famous Restigouche Salmon institution in 1872, (twice rebuilt), and the Miramichi Hatchery in 1873. In 1874 the Gaspe Hatchery was commenced, and in 1875 a large mill was purchased at Tadoussac and converted into a fish-breeding establishment, supplanted by a new building later. The work expanded, so that Mr. Wilmot, in Feb. 1875, was able to speak of five hatcheries in Canada, four of them in full operation.

Much interest naturally centres in the Newcastle Hatchery on Lake Ontario, where thirty-five years ago the work commenced. The building, enlarged and improved, is situated on a small stream at the head of a small creek or marsh opening into the lake near Bowmanville, and about thirty-five miles east of Toronto. A sheltered and secluded valley of great sylvan beauty encloses the site, but the work has always been handicapped by its distance, both from good spawning grounds, and from suitable areas for planting the fry. Mr. Wilmot erected the hatchery, as was natural, near to his own residence, and at a time when salmon frequented Lake Ontario, and resorted to the creek in question for purposes of spawning. For many years salmon have been practically extinct in these waters, and the hatchery failed in its original purpose of keeping up the supply of Lake Ontario salmon, which Mr. Wilmot claimed to be indistinguishable from the sea-going Atlantic Salmon. From 1868 to 1873 over a million fry were sent out from this parent hatchery (an average of 200,000 per annum.) A small private hatchery was also carried on during these earlier years of Canadian fish-culture, by the well-known salmon fisherman and merchant, the late John Holliday. Mr. Holliday was born on the banks of the famous salmon river, the Scottish Tay, and was stimulated, no doubt, by the salmon-culture work at Stormonthfield, in Perthshire, commenced in 1853 by the proprietors of the salmon fisheries on the Tay. He built a hatching establishment on the Moisie River (north shore of the Gulf of St. Lawrence), which has continued its operations to the present time. Messrs. Brown and Co., also erected a trout hatchery at Galt, Ont., and, in 1868 had no less than 10,000 parent trout impounded in one of their ponds for the purpose of taking spawn for hatching purposes. Other hatcheries privately conducted with zeal and success might be named, such as the Credit Forks Hatchery carried on by Mr. Chas. Wilmot, the Silver Creek establishment near Toronto and others.

In the United States, it was not until 1871 that fish-culture became a recognised department of work under the auspices of the Federal government. Previous to that year individual States had made attempts in this direction, indeed, New Hampshire in 1865 had commenced fish-hatching operations, and agents were sent to

the rivers of Canada, where they were permitted (as Mr. Charles G. Atkins tells us) to take salmon from the spawning beds, and were thus enabled to secure some hundreds of thousands of eggs, which were "hatched with a measure of success." Pennsylvania and the State of Connecticut followed in 1866. In 1867, 1868, 1869 and 1870 the States of Maine, New York, California, New Jersey, and Rhode Island, severally began fish-culture in their respective territories.

In Canada the salmon and brook-trout naturally claimed first attention ; but in 1867 and again in 1868, whitefish were successfully impregnated and hatched by Mr. Wilmot as he tells us in one of his reports. A pioneer fish-culturist in the United States, Mr. N. W. Clark of the State of Michigan has been credited with first successfully handling the eggs of the whitefish (*Coregonus clupeiformis*) on this continent, but the statement published by Mr. Wilmot gives four or five years priority to the Canadian, if, as Mr. Clark said, the first whitefish eggs in the United States were artifically hatched in 1872 (see U. S. Fish Comm. Report, p xxvi, 1872-73). In 1875 a whitefish hatchery of large capacity was completed at Sandwich, Ontario, and has carried on, with marvellous success, the incubation of the eggs of that species on the Detroit River.

Under the zealous and indefatigable Samuel Wilmot, fish-culture in Canada made rapid strides, and the Dominion has generally been acknowledged to be in the front rank in this work. France and Germany were in advance, it is true, so far as exact scientific methods and knowledge were concerned, and the United States has taken the lead in making most munificent provision from the public funds for pisciculture, and Great Britain has set a worthy example in private enterprises and in costly experiments under skilled superintendence, witness the Stormouthfield*, Howietown, Cray's Foot, and Guildford establishments.

Canadian fish-culture was no doubt conducted in a rough and ready manner, the Superintendent and his staff being practically self-taught, so that many blunders were committed, and many erroneous methods for some years adopted. But the conditions were so favourable, the purity of the water and the abundance

*Now supplanted by Dupplin

and coldness of the supply, the robust and healthy nature of the parent fish, and similar circumstances compensated for much that was lacking in manipulation and technical knowledge, during the early years of Canadian fish-culture. "The most important requisite . . . . is pure water, it is indeed to a hatchery what coal is to a steam-engine" said the late Sir James Gibson Maitland (Int. Fisheries Exhib. London 1883) to whom Scottish fish-culture owed so much. It may be doubted whether any other country can offer conditions so favourable as Canada, and it is certainly remarkable that in the vast number of fry of various species, hatched year after year in the Dominion hatcheries, abnormal or deformed fishes hardly ever occur. Monsters as a rule are familiar enough in the tanks of European hatcheries, but nothing is so rare in Canadian establishments.

The following brief *resume* of the progress of fish-culture operations in Canada gives at a glance the stages of its advance. The Newcastle (Ont.) hatchery, as already stated, came under government control in 1868, or rather 1867, and there have been hatched, since that date, Lake Ontario salmon, Pacific spring salmon,* brook trout, black bass, German carp, Great Lake trout, dorè or pike perch and lake whitefish. Ontario salmon became practically extinct within a few years after the hatchery was started, and Pacific salmon do not appear to have thriven, one or two questionable records only of their capture having been announced, while black bass proved only partially successful and carp were a total failure. Brook trout, being mainly a game fish and of inferior commercial importance, was eliminated in 1892, though its culture was a marked success. Thus the hatchery has confined its work to the incubation of Great Lake trout, the eggs being secured by government officers at Wiarton, Georgian Bay, and the Lake whitefish, transferred from the Sandwich hatchery, early in the year, generally February, in the eyed stage.

The following table embraces details respecting the remaining 14 hatcheries arranged for conciseness and convenience of reference.

*Professor Spence F. Baird generously sent from the United States at various times eggs of the Quinnat or Spring salmon.

Founded	Location.	Kind of Fish Hatched.	Ann'l Outp't
1874	Deeside, Restigouche R.	Salmon	1 to 3 millions
	South Esk, Miramichi R.	Salmon and Sea Trout	1 to 1½ "
1875	Tadoussac, Saguenay R.	Salmon and Hybrid Ouananiche	1 to 3 "
	Gaspé, P. Q.	Salmon	1 to 1½ "
1876	Sandwich, Ont.	Whitefish, Pike Perch or Dore	10 to ov'r 70 mil
	Bedford near Halifax, N. S.	Salmon, Whitefish and Great Lake, and Rainbow Trout	1 to 5½ mill'ns
1880	Grand Falls, St. John R. N. B.	Salmon Whitefish and Great Lake Trout	2 to 4 "
	*Dunk R, P. E. Island	Salmon	1 "
1881	Magog near Sherbrooke, P. Q.	Whitefish and Great Lake Trout	1 to 4½ "
1882	*Sydney, Cape Breton.	Salmon	1 to 2 "
1884	New Westminister, Fraser R., B. C.	Pacific Salmon (Quinnat and Sockeye)	2 to 10 "
1890	Ottawa Hatchery.	Whitefish and Great Lake Trout	3 to 7 "
	Bay View near Pictou, N. S.	Lobsters	60 to 100 "
1894	Selkirk, Red River, Manitoba.	Whitefish	4½ to 19 "

The total quantity of fry of all kinds distributed from the foregoing institutions since fish-culture has been carried on by the Dominion government, that is from 1868 to 1899, both years inclusive, is no less than 2,650,468,200. The average annual quantity during the last 20 years has been 128,000,000. In 1895 the output was extraordinarily large, amounting indeed to nearly 300 millions. For the last nine years vast quantities of lobsters have been hatched, the annual average being no less than 100,000,000. Deducting these from the total output, we find that the average output each year, during the last twenty years has been 85 millions, mainly of the three kinds, salmon, Great Lake trout and lake whitefish (*Coregonus*), which are all fishes of great economic value.

Whatever may be said for or against the artificial hatching of fish, no fair-minded critic can doubt, that the distribution year after year, of this enormous quantity of young fish must have benefitted our waters to an incalculable extent. Artificially hatched fry, unlike those hatched naturally on the spawning beds, must in the eyes of some critics, be more at the mercy of enemies when newly planted. Nothing, however, could be more helpless and unprotected than naturally hatched fry, and those turned out from hatcheries are really less at the mercy of enemies, inasmuch as they are always some days old, frequently several

*Dunk River hatchery was destroyed by fire and Sydney hatchery has not been operated for three seasons pending the completion of a new Cape Breton hatchery.

weeks old, before being planted, and should be more sturdy and robust than the fry exposed immediately after hatching, on the natural spawning beds. Nor is the objection better founded that the fry are suddenly transferred from the warmer water of the hatchery to the colder water of the lake or river outside. Records, which have been kept, show that the water flowing rapidly and plentifully through the tanks is more equable and cold than the shallow waters outside. The fry, it is further contended, are untaught to seek shelter, and must be gobbled up by watchful enemies. This cannot be so. The eggs are all taken from wild fish, and the young inherit the instincts of their parents. Hence when the fry have been carefully watched at the time of planting, they have been noticed to act with alertness and intelligence, and at once dart off to shelter. All the stock objections are made in ignorance of the real facts, for the facts all prove the very opposite of the theories set forth by critics, usually arm-chair critics.

Fish-culture, at this late date, needs no advocacy or defence, yet recent unsolicited testimony may be adduced, sent to me as affording evidence of the success of the government hatcheries. A lake near Three Rivers, P. Q., was planted several years ago. It abounds at the present time with fine lake trout, says the member of parliament, who is my informant, although these fish did not formerly occur in it at all. A lake in Victoria county, Ontario, I have recently been informed by residents, is alive with trout consequent on being stocked by means of fry. Most visitors to the river Saguenay know the Tadoussac Hatchery, and the small lake adjacent to the building abounds in small salmon a few pounds in weight, the result of the surplus quantities of fry placed there by the hatchery officer. "On one occasion," says the officer in an official report "I permitted the Bishop of Chicoutimi, to fish in the hatchery lake. He was accompanied by the Rev. Mr. Mathieu, Superior of the Quebec Seminary, and the Rev. Mr. Lemieux, of Tadoussac, they were astonished at the number of young salmon that could be caught." A most convincing case came to my notice, however, on the testimony of a gallant and facetious member of the House of Commons, who bitterly complained that a New Brunswick lake, stocked with brook trout at much cost, had received also some Great Lake trout from a

Government Hatchery. The latter have so prospered and grown in size and numbers, that they are cleaning out the brook trout, formerly so abundant in it. The Club who lease the lake are anxious to exterminate the hordes of huge lake trout which are the direct result of fry planted there from Grand Falls Hatchery, and the use of nets has been resorted to, enabling some fine specimens of these "fresh-water sharks" to be captured. Deplorable as are the results from the Club's point of view, no better testimony to the success of the government's hatchery work could be adduced.

To most people fish-culture is thought to consist in taking some ripe mature fish, just before spawning, squeezing eggs from them, fertilising them, and placing them in jars or on trays, in a current of water until the young fish hatch out. Fish-culture is, however, much more than that, it includes at least half-a-dozen different methods. Of course, one method, and that most familiar, consists in obtaining ripe living fish of both sexes, and after subjecting them to the same process of careful and gentle pressure, mingling the two products in a spawning vessel or dish, where the eggs are rapidly fecundated, and then transferring the vivified eggs to the trays or hatching jars. The parent fish, being handled with care are returned to the water, with rare exceptions, alive and unharmed, and in the case of salmon usually continue the ascent up-stream, which had been interrupted by the hatchery officials. In B. C., it is said, the spawned fish frequently descend, but this may depend upon the sex, for Frank Buckland noticed that male salmon invariably bolt up-stream if disturbed, whereas the "hens" or female salmon bolt down stream. The fish do not die, as the signs of ripeness are readily visible to the expert officer's eye, and ripe fish are spawned painlessly and with the utmost readiness and ease. It is a curious fact that eggs from dead fish may be successfully used if death is recent. Thus the distinguished Russian naturalist, Owsiannikoff, in a paper read in 1869, before the Imperial Academy of St. Petersburg, stated that he had fertilised the eggs taken from dead fishes, and in most cases with success. Different species also may be crossed and hybrids readily produced but there are limits to the process due, no doubt, to certain microscopic peculiarities in the structure of the egg capsule.

Two methods of fertilisation have been adopted, the wet and the dry, and the latter has almost universally superseded the former. In the dry method no water is added until some moments after the ova and milt have been mingled and gently stirred with a feather or the fingers. In the early days of Canadian fish-culture the wet method was followed, and the eggs were placed in water before the milt was added, and a proportion of eggs always failed to be fecundated, hence the universal adoption of the so-called dry method.

Some of the different methods followed in obtaining eggs or fry may be here instanced.

(1) The parent fish are secured some time (days or even months) before spawning, and impounded until they become ripe and swollen. Whitefish are often kept in this way, and the plan has been adopted in Canada of confining salmon in tidal ponds for many months, and apparently without harm. Indeed the salt water prevents fungus, and as salmon take no food after leaving the sea, there is no difficulty in retaining them until the spawning season, and then taking the eggs and milt. After being kept from June or July until October or November the parent fish are liberated on being artificially spawned.

(2) The parent fish are netted at the spawning time near the breeding beds. Salmon, in British Columbia, are treated in this way, also Great Lake trout and whitefish. The parent fish are rarely injured, and are thus liberated in their native waters.

(3) Parent fish are captured and the eggs taken and fertilised, but the fish are killed and sent to market. This is the plan adopted in some cases by U. S. fish-culturists, especially with the Great Lake trout. It is unavoidable as a rule, with black bass and sturgeon, even when very ripe, as they refuse to yield their spawn. It is not adopted in Canada.

(4) Parent fish are impounded in ponds or enclosures, where they deposit and fertilise their spawn naturally. The spawn is then transferred to the hatchery and incubated artifically. Bass, maskinonge, perch, carp, sturgeon, etc., have been treated in this way.

(5) A similar plan to the last is followed excepting that the eggs are allowed to hatch out in the ponds where deposited.

(6) Instead of securing the parent fish, or obtaining the eggs after being deposited, the small fry, incubated and hatched naturally, are netted and used for purposes of stocking waters. Trout and black bass have been mainly introduced into new waters by this method. Black bass, when very young, devour each other, even when only a little over an inch in length, and the Caledonia (N. Y.) Hatchery officers have reported that their young black bass grow so rapidly that they must be shipped immediately after being collected in the adjacent marsh ponds. Nearly 400,000 of these fry are annually distributed from the American hatchery named.

It is plain that if we can secure the eggs from the ripe parent fish, fertilize them by the dry method, and hatch them under the care of experts, the results must infinitely surpass those possible under natural conditions, where a small proportion only can be expected to surmount all the dangers and difficulties of their environment. Let me give an illustration of this waste of eggs on the natural spawning beds—a waste not contrary to natural law, but obedient to the principle of compensation and adjustment, universal in the world of nature. In 1895 I spent some time closely observing certain spawning beds of the Fraser River salmon, commonly called sockeye or blueback. I noticed, not once, but scores of times, pairs of fish busy nesting, the male fish lingering near his partner until she shed a shower of eggs. Just as the eggs were cast into the rapid stream, the male fish had his attention attracted by a rival, and darted with lightening speed to drive him off, both male fish tearing at each other with gaping jaws, armed with formidable teeth, the teeth at this time being of abnormal size. Time after time I saw female fish wasting their eggs in this way, for the eggs deposited in the gravel by the female, while her partner was engaged in a fight twenty or thirty yards away, were unfertilized and would, of course, perish or be eaten by hungry enemies, suckers, trout, etc., which hovered near in hordes.

The curious fact repeatedly noticed by observers, that male salmon outnumber the female; and the fierce fights and numberless resulting deaths, may be a device for reducing the surplus number of one sex. "To me it is the strangest puzzle," said Frank Buckland, "why the male fish always predominate over

the female," and he asserted that frequently there occurred seven males where there might be not more than one female salmon. During the second year of the Restigouche Hatchery's work, the late John Mowat reported that the male fish were in excess of the female as two to one, and the late Alexander Russell, in his famous book "The Salmon," gave prominence to Shaw's not less interesting discovery, that in the young striped "parr" stage, male salmon are mature, "the male parr (alone) arrives at sexual maturity, and does and can impregnate the ova of the adult female salmon."

If, to the natural loss of enormous quantities of eggs by non-fertilization, be added the depredations of ducks, loons, herons and aquatic birds, not to speak of otters and four-footed enemies, as well as destruction by floods, by mud, gravel and ice, it is easy to see how great are the advantages offered by artificial incubation, and by caring for the eggs in properly equipped hatcheries.

Anglers, as a rule, favour fish culture, but there are exceptions, and the sportsman needs to be reminded that, whereas, the fish are liberated strong and uninjured after being artifically spawned, those taken by the angler's line shortly before the breeding season, are killed and prevented from fulfilling their task of peopling the waters with young brood. It is easy to hatch 90% of salmon eggs in a hatchery, whereas, Sir Humphrey Davy estimated that not six per cent. of the eggs deposited on the breeding grounds, come to perfection, and Stoddard held that only four or five fish fit for the table were the result of 30,000 ova on the spawning beds. The take of salmon in a single net may suffice to furnish enough eggs to keep up the supply of young fish, and it is the rule at the Government nets to liberate all fish not required, and these are allowed to ascend to the upper waters. Thus at the Tadoussac nets in 1889, 559 salmon were taken for the hatchery, but 310 of the largest were sufficient, and the remaining 249 were turned into the river again. This is frequently done. In most of the hatcheries reliance is placed upon the Departmental nets, managed by the hatchery officers. In these nets fish are trapped, and after being spawned are set free. In some cases parent fish are bought from local fishermen by special arrangement, but the plan has, on the whole, proved uncertain, as the fishermen asked exorbitant

prices, or ignored their agreement and shipped the fish straight from their nets to the markets, leaving the hatchery officers in the lurch. Many parties have entertained an ignorant prejudice against artificial hatching of salmon, not fishermen only, but men of education and social standing. Thus the lessees of certain rivers in Gaspe, refused to allow any salmon to be taken for hatchery purposes, and anglers who have been known year after year, to kill hundreds of salmon in famous pools, really spawning grounds, have declaimed against the inhumanity of taking the spawn from the small number of parent fish, which are ample for supplying a salmon hatchery.

Frank Buckland has truly observed that "the success of salmon egg-collecting depends upon very small circumstances, and he specifies seven necessary provisions to be made by the "spawner," viz, : a water-proof suit, spawning pans of large capacity, a long, shallow basket to hold the fish under water until wanted, hose flannel in yard lengths for wrapping the struggling fish when spawning, dry towels to wipe slime off the hands, moss and trays, and lastly, nets.

In a report published in the Marine and Fisheries Blue Book, 1896, I described all the types of fishes' eggs known to scientific experts. I grouped them under seven heads, according to their special features, and I pointed out that they varied in shape, size, external structure, etc. The smooth, spherical, pea-like eggs of the salmon, trout, whitefish, and the like, are far more favorable for artificial incubation than slimy eggs, eggs clinging in bunches, eggs in gelatinous strings, eggs covered with spines, oval eggs. and other varieties.

The eggs resembling peas vary in size in different species. A quart measure is frequently used in counting eggs on account of its convenience. The measure holds 57.75 cubic inches, and has been found to be capable of containing 3,300 land-locked salmon eggs ; 4,272 Atlantic salmon ; 3,696 Pacific salmon ; 5,525 Great Lake Trout ; 8,311 to 9,935 English Brown trout ; 12,063 to 13,998 American brook trout ; 24,363 striped bass ; 28,239 shad ; 36,800 lake whitefish ; 73,938 maskinonge ; 152,292 pike, perch or doré ; 233,280 tomcod ; 335,000 cod ; 496,000 smelt. In diameter the eggs vary from ¼ of an inch in the Atlantic salmon, and 3/16 of an inch in the brook trout, to 1/30

of an inch in the tomcod (*Gadus tomcod, Walb*) or 1/25 of an inch in the silver hake (*Merlucius*).

When the ripe female fish is being spawned by the hatchery operator, the eggs run freely in a stream into the pan or dish, previously rinsed in clean water, the operator gently pressing the abdomen with one hand, while with the other he holds the fish firmly in the region of the anal fin, the head of the fish being secured under the armpit, if a large fish like a salmon. A male fish is then treated in the same way, the milt flowing into the spawning pan amongst the eggs, and the eggs are stirred with a feather, thus securing fertilization. After being washed, the eggs are placed either upon black Japanned tin trays, 15 in. x 10 in. x 7/8in, perforated with small holes and holding about 2000 salmon eggs, or they are placed in glass vases 20 in. x 6 in. in diameter. The former are more suitable for salmon and trout, the jars being best for whitefish. Zinc trays are found hurtful to eggs, the officer at the Miramichi hatchery reporting in 1874 that a large number of salmon eggs were poisoned from this cause. The eggs, being alive, require abundant oxygen, hence a continuous stream of water must pass over them day and night until they hatch out. Under natural conditions river-water, of course, pours over the eggs, but fish culturists are agreed that spring-water is preferable for hatching purposes, not only because the temperature is more equable, but is purer and more free from debris and vegetable matter. In 90 to 120 or 150 days, the young fish burst from the eggs; shad, however, take only from two to five days, and cod hatch in ten to thirty days. Most of the valuable fresh-water species, like the trout and whitefish take many months. In special cases where the hatching of sturgeon and shad has been attempted as in Chautauqua Lake, N. Y., hatching boxes with double wire screen, top and bottom, have been placed in a running stream, or if containing maskinonge eggs, have been sunk at a depth of four or five feet in the lake. The fry are transferred to large tanks for periods of a few days or a few weeks, and are distributed in large cylindrical cans, nearly two feet high and twenty inches in diameter, the narrow neck of which is devised to hold ice in hot weather, in order to keep the water cool.*

*Fry are conveyed up some salmon rivers in floating crates or perforated boxes, and 25 miles of a river can be planted in a day.

The young fish carry beneath the body a small bag of food yolk, and require no other food until it is used up—a few days sufficing in some species, a few weeks in others. If possible, the fry should all be planted before the store of natural food is exhausted. In stocking lakes or rivers it is best to select inshore shallows not frequented by large fish, or rocky ridges and banks far from shore. The fish travel by rail or team for long distances without serious harm, if ice is used with care. Short distances are, however, best ; indeed, Mr. Samuel Wilmot urged the establishment of small supplementary hatcheries, where the advanced eggs could be sent just before hatching, and the fry more safely distributed from them. "This system of carrying, or rather trying to carry, young fry to distant points (particularly where no speedy means of travel by railway is to be found) should be discontinued (said Mr. Wilmot in 1877), because the time almost invariably spent in fruitless journeys of this kind, could be so much better and more profitably applied at nearer points, where the safety of the young salmon in the transit could be relied upon." At times a few thousands of fry have been kept until they are four or five months old ; but constant care is necessary, and a large proportion as a rule, die when the fry are kept out of their natural habitat in lakes or rivers. The feeding of fry is not easy, as the quantity and kind of food require regulation, or the results may be fatal. In 1887 eight or ten thousand young salmon were retained in a pond at the Restigouche hatchery, and were fed during the summer, "yet they did not seem to thrive well, as but few were seen in October when the pond froze over (as Mr. Alex. Mowat reported)....I have very little faith in the attempt to grow salmon fry with artificial foods, with a view of realizing any benefit from the proceeding." Last year Mr. Mowat again kept some salmon fry (about 10,000) in outside tanks with an ample stream of water passing through. Mr. Mowat is one of the best practical fish-culturists living, and this experiment was a success owing to special attention, the fry growing satisfactorily until they were nearly six months old. The food consisted of finely ground raw fish and liver; but quite as important a matter was the intelligent manipulation and care of a zealous officer in charge. The fish were well fed, yet not overfed, and kept perfectly clean, by the removal of dead and decayed matter, especially waste food

particles. Many of this batch of fingerlings measured fully three inches in length. The growth of fishes, especially young fishes, varies extremely ; thus brook trout are usually two inches long when four months old ; three inches when eight or nine months old, and five inches when a year old. Lake trout are six inches long at the end of the first year, and black bass at the same age are four to six inches. Salmon, when confined in ponds, are often stunted in growth, thus 3,000 salmon fry were planted in a small lake near Louisburg, Cape Breton, in 1888. In 1889 they were three or four inches long, and in 1891 (in their third year) some were caught with the fly, but were not more than eight inches in length. A similar experiment at the Restigouche Hatchery, resulted in producing young salmon, seven inches long in the third year, and ready to descend to the sea.

Discretion is not always shown in the planting of fish suited to the waters selected. Carp have been a questionable benefit, black bass in some waters have been far from a blessing, and that splendid game fish, the maskinonge, proves to be a veritable fresh-water shark in some lakes. "If planted in many of the small inland lakes (says Mr. Annin, jr., Supterintendent of N.Y. State Hatcheries) the result will be that perch, pickerel and bass fishing would be greatly damaged." If predacious fish abound, it is useless to attempt stocking with a better class fish. The fry are inevitably exterminated. In Chautauqua Lake, N.Y., the U. S. authorities wisely decided to clean out that voracious ganoid, the bill fish (*Lepidosteus*), and in two seasons over 4,000 of these useless fish were captured in seines, pounds and traps, such extermination being often necessary before stocking begins. For some years the pike perch or doré (*Lucioperca* or *Stizostedion*) were hatched at Sandwich and at Ottawa. The first batch, about one million, were hatched in 1881, but partly on account of difficulties in securing ample supplies, this species was, after ten or eleven years, no longer embraced in the Government operations. Black bass too, for a time, were hatched at Newcastle, and German carp were also included, for one or two seasons, under the mistaken idea that it would introduce "into ponds and waters (to quote Mr. S. Wilmot's report) now depleted a highly esteemed description of food fish hitherto unknown in our country." A thousand young carp were, with the late Prof. Baird's

consent, brought from Washington to Newcastle in December, 1880. Some were planted in ponds in Manitoba, but apparently without result. Pacific salmon have also been introduced into the waters of the eastern provinces. In October, 1873, 20,000 Quinnat or spring salmon eggs were generously donated to the Newcastle Hatchery by Prof. Spencer Baird ; they hatched out in December, and were planted in April following. In 1874 a second lot was sent, and in Oct., 1875, a third consignment of 80,000, (of which half were sent to Tadoussac Hatchery), and in 1876 a further batch of 40,000, and in November a further shipment of 80,000. Other lots of many thousands were kindly given by the U.S. authorities, but the results appear to be decidedly inconclusive. A fish, 15 inches long, was described by Mr. Wilmot as being captured near the Newcastle Hatchery in 1876 in the creek there and regarded as a Quinnat. "It was totally unlike the ordinary grilse or smolt of the stream, and was a male with matured milt," said Mr. Wilmot. and he added, "The first lot of California eggs was received at this place in the fall of 1874 ; this salmon must, therefore, have been two years old from the egg." In July, 1877, several more, it said, were taken. The officer in charge of the St. John River Hatchery, N. B., reported in 1885 that there were grounds for regarding the planting of Pacific salmon (Quinnat) in 1881, as a success. He reported : "Just as soon as the fishermen set their nets in spring they began to capture a strange, and to them, peculiar species of salmon with which they were unacquainted. This gave rise to enquiries and investigation, which resulted in the fact that they were California salmon, averaging some seven or eight lbs in weight. Consequently they must have been some of the identical salmon that were hatched in the Rapide des Femmes Hatchery and put into the St. John River, four years ago last March." In March and April, 1881, 35,000 young California salmon had been sent to this hatchery.

Lobster hatching had been tried in Norway by Capt. Dannevig as early as 1885, and three years later Mr. Adolph Nielson commenced operations in Newfoundland. The United States also carried an artificial lobster hatchery. A fine building, 75 feet by thirty-five feet broad, was erected at Caribou Harbour, near Pictou, N. S., and began work in 1891. A

duplex pump and twenty horse-power steam engine, draw salt water from the bay, and a wharf running out to 20 ft. depth of water, enables tugs to come alongside with supplies of lobster eggs obtained by the hatchery officers at the canneries. The eggs, it may be mentioned, are carried attached to the swimmerets in bunches, under the body of the female lobster. Ripe and well-developed eggs are selected, and are known by their paler colour as compared with the deep green or black of the newly extruded eggs. With a spoon, the hatchery operator scrapes off most of the eggs, leaving some still adhering, including some that are unavoidably crushed or burst. Having visited several of the lobster canneries, and picked out egg-bearing lobsters sufficient to give him an adquate supply—the lobsters, of course, being alive and newly brought in from the trapping grounds—the operator at once conveys the eggs in buckets on board a tug to the hatchery, places them in upright jars or vases, slightly wider than whitefish jars, where they are kept rolling about by rapidly circulating sea water until they hatch. At a temperature of 56° or 58°F, they may hatch out in 24 hours; but they frequently take fourteen or fifteen days, if the temperature is lower and the eggs are not advanced in development. At a temperature of 40° or 50° F. lobster eggs take many months for the incubation process, but so favourable are the conditions at the Bay View Hatchery, Caribou Harbour; that the annual operations are frequently over in five or six weeks in May or June. The young fry are like little active shrimps, swimming head foremost in contrast to the adult lobster, and they are so cannibalistic that they must be planted at once. They are conveyed in barrels on board a tug, each barrel having a square lid cut out, at the side which is uppermost, for aeration, and the young lobsters are lifted by scoops or dippers, and scattered in the surface waters 3 to 10 miles from land. The method of scattering them by means of a hose pipe at the stern of the tug was not successful, the delicate fry being injured. Lobster fry are never found close inshore but are pelagic in habit, and frequent the surface of the sea many miles from land. The methods in vogue at the Canadian Lobster Hatchery appear admirable, and should ensure in due time, beneficial results for the lobster fisheries along the Atlantic coast. For the sake of clearness a brief summary of some of the features of Fish-culture in

Canada may be referred to in a concluding paragraph :—

(1.) Fish of supreme commercial importance only are hatched, hence species, which are chiefly valued for sport only, are excluded.

(2.) Eggs, the hatching of which is difficult or hazardous, e. g. black bass, maskinonge, sturgeon, etc., are not included. Results, commensurate with the expenditure of public money, are problematical in the case of such species.

(3.) As far as possible all parent fish are returned alive to the water after spawning.

(4.) Salmon are impounded in tidal ponds for many months prior to the breeding period in the fall. They cease to feed on entering the mouths of rivers, and the sea water keeps them free from fungus and disease. Lake trout and whitefish, also are kept in pens or pounds for a few days before being artifically spawned.

(5.) Fry are distributed gratis on the applications being officially approved, and the government bears the expense, wholly or partially, of shipment and planting.

(6.) Lastly the fry are all practically shipped in the recently hatched condition (three days to three weeks old). This is unavoidable when vast quantities, tens of millions, are handled. Retention of the fry would involve great expense and serious loss by death, and all the applications could not be filled.

It is hardly open to dispute that the planting, year after year for over 30 years, of countless numbers of young fry of valuable economic fishes must have vastly benefited the waters of the Dominion.

The hatching of cod, mackerel and other marine fishes has not so far been attempted in Canada. The eggs and fry of these fishes are not so favourable for the methods of artificial culture, and the vast numbers produced by each spawning female (a single cod shedding 9 to 10 millions of eggs each season), the extremely delicate pelagic character of the eggs, and the futility of handling successfully the fry, are the reasons which

have deterred the government from taking up this work. If Canadian fish-culture is doing anything to keep up the supplies of fish in our salmon rivers, our great lakes and inland streams, it is doing much. By introducing western species into eastern waters and *vice versa*, it may do more, and we may therefore be content to permit the illimitable ocean, open to all the fishing fleets of the world, to be recuperated by the unassisted methods of Nature herself.

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TRANSACTIONS

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OTTAWA LITERARY AND SCIENTIFIC SOCIETY.

INTRODUCTION.

In his Introduction to the last number of these Transactions, my learned predecessor in the presidential chair, Professor Edward E. Prince, was so unmindful of any possible bent for loquacity on the part of his successors in office as to declare, without any reservation whatsoever, "that the days of lengthy introductions, of formal preludes and prologues, are over." It, therefore, behooves me to say that under the suasion of this opinion I shall do my utmost to emulate Polonius, and regard "the soul" and not "the limbs and outward flourishes" of wit.

It will be noticed that the bulk of the present issue of Transactions is considerably less than that of the preceding volume. This shrinkage arises not from any appreciable falling-off in the number of our public lectures during the past two seasons as compared with previous years, but from the fact that, some of them being delivered extemporaneously, the lecturers were not able to furnish manuscripts in time for the present publication. This is a

matter of extreme regret to the Council of the Society, as the subjoined programmes for the seasons 1900-1901 and 1901-1902 comprise a number of lectures, more particularly in the province of science, which well deserve communication to a much larger public than that which had the pleasure and profit of listening to them when delivered.

The public proceedings of the Society for 1900-1901 were as follows :—

1900—Nov. 23—Conversazione, opened by an Address by the President.

Nov. 30—Professor E. E. Prince, B.A., F.L.S.,
"Land and Letters of the Pastons" (Illustrated.)

Dec. 14—Mr. O. J. Jolliffe, M. A.,
"Windsor Castle and Its Memories" (With Limelight Views.)

1901—Jan. 11—Capt. C. F. Winter,
"South African Sidelights"

Jan. 18—Mr. H. A. Harper, M. A.,
"The State of Labour, with Especial Reference to Canadian Legislation."

Jan. 25—Mr. Benjamin Sulte.,
"The Feudal System in Canada"

Feb. 8—Mr. Lawrence J. Burpee.,
"Canadian Novels and Novelists."

Mar. 22—Mr. W. L. M. King, M. A., I L.B.,
"Some Thoughts on Social Progress."

Mr. Otto J. Klotz.,
"Metrology"

Professor E. E. Prince, B.A., F.L.S.,
"Heredity in its Scientific and Practical Aspects."

The following programme represents the public proceedings of the Society for 1901-1902.

1901—Nov. 15—Conversazione. Historical Sketch of the Society by the President.

Nov. 29—Prof. E. E. Prince, B. A., F. L. S.,
"The Royal Game of Golf." (Illustrated)

Dec. 13—Lt. Col. W. P. Anderson, C.E.,
"Modern Types of Danger Warnings on the Sea Coast" (Illustrated)

1902—Jan. 10—Mr. J. M. Macoun.,
"Fauna of the Chilliwack Valley."

Mr. O. J. Jolliffe, M. A.,
"Alfred the Great."

Mr. Otto J. Klotz.,
"The Pendulum." (Illustrated)

Feb. 7—Professor E. Haanel, Ph. D.,
"Ions." (Illustrated)

Feb. 21—Mr. D. H. Keeley.,
"The Marconi System." (Illustrated)

Mar. 7—Mr. G. R. Maxwell, M. P.,
"The Teachings of Sartor Resartus."

Mar. 21—Dr. Charles Morse.,
"Impeccancy of the King."

While candor demands the admission that the attendance at these lectures was not so large as it should have been, yet it is gratifying to be able to state that there has been a noticeable improvement in this respect during the past two seasons. On the other hand, at no time have we had to complain of the *quality* of our audiences. That has ever been a source of encouragement to those

who have labored in the interests of the Society. But, indeed, it may be asked if the attendance at any didactic lecture, except that of the curtain variety, wholly justifies the zeal of the lecturer? And even the immortal Mrs. Caudle was never entirely pleased with her audience—at least that would appear to be a fair inference from her observations as reported for us by Jerrold. The true reward to those who, by their public addresses, so generously assist this Society in the promotion of its high aims lies in the acceptance and appreciation which our Transactions receive from kindred organizations, the world over, with which we exchange publications.

It may not be altogether without the scope of this foreword to allude to the munificence of two life members of the Society, Mr. Thomas Ahearn and Mr. John Manuel, whose recent donations have enabled us to make substantial additions to certain departments of our library which had theretofore languished from lack of funds. The good judgment of Council in expending the moneys so donated is attested by the fact that the Librarian's books show a marked increase in the proportion of solid and instructive literature in circulation as compared with that of the lighter sort. And just here let me say that while our library is of modest dimensions, it extends itself wholly within the domain of good literature. True, Novels are to be found there; and that is because we have no quarrel with such pleasures of the imagination in the abstract. Did not literature begin with Fiction; and are not its chief activities manifested to-day through the medium of the Novel? "The Epic and the Drama," observes Andrew Lang, "were the Novels of the Greek and Elizabethan ages; they held the popular place

which Novels hold now." And so when an essay in fiction is tabooed from our shelves it is simply because, in the judgment of Council, it falls within the class of books which Charles Lamb would designate *biblia a-biblia*. However, is is with books which Bacon quaintly counsels us are to be "chewed and digested."—books which go to feed the hunger of the true 'inner man'—that we have our prime concern; and it is from this stand-point that we regard the circulation of our volumes as one of the most important means of achieving the ends for which this organization was constituted so many years ago.

It is a source of much satisfaction that I am able to conclude my observations with the statement that at no period in its history has the Ottawa Literary and Scientific Society given greater evidence of activity along all its lines of usefulness than it does at the present day.

CHARLES MORSE,

President.

Ottawa, 23rd October, 1902.

Canadian Novels and Novelists.

By Mr. Lawrence J. Burpee.

[*Read February 8th, 1901.*

I have interpreted the title of this paper in the broadest sense, as including all branches of fiction, the novel proper, the romance, the short-story, etc. When the subject first suggested itself to me, I felt that there was scarcely sufficient substance in it for even a short paper, but upon making a careful examination of the field it appeared that instead of the existing material being meagre, I should have to resort to rigid compression to keep the paper within reasonable bounds. The very interesting section of French-Canadian fiction is consequently omitted altogether, to be dealt with perhaps on some future occasion, and in reviewing the course of the English section of our fiction, I have confined anything like a full treatment of the novelists and their books to the earlier and little-known writers, passing over more recent names as briefly as possible. 1

Under the adverse conditions of pioneer life in a new country the first feeble efforts towards literature, semi-conscious at best, are found to be rather practical and utilitarian than intellectual. This applies especially to the case of Canada. Going back to the earliest beginning of our literary history we find, first, certain rough and ready accounts of explorers and navigators, descriptions of the country, its natives, etc. Then, books of advice (wise or otherwise) to immigrants, and other things of the kind. Following these, we come upon a mass of

1. A somewhat full consideration of the contemporary group of Canadian novelists will be found in an article by the writer, in the *Forum*, New York, August, 1899.

controversial matter, pamphlets, broadsides, early newspapers, and the like, contemporary narratives, etc, all of which eventually become the happy hunting-ground of the national historian. Afterwards the half-fledged off-spring of the Colonial Muse appears, singing in halting measure the simple but sincere songs of the new land of promise. And, finally, come the novelists, product of a period when the colony is developing into something like nationhood; when the stress and strain of frontier life has worn off, and men have time and inclination to write and read fiction. This literary development is not, of course, as distinct and arbitrary as the statement would imply. We shall discover one or two premature novelists in the earlier periods of our history, but, nevertheless, anything like a general development in the writing of fiction, or the appearance of a recognized group of Canadian novelists, is not to be found except within the last decade or two.

The first novel written in Canada was "The History of Emily Montague," by Mrs Frances Brooke, wife of the chaplain of the garrison at Quebec. This book belongs to the once-popular class of epistolary novels. It was written in Quebec, and published at London in 1769, sixteen years after the appearance of the last of Richardson's famous trilogy of epistolary novels, "Sir Charles Grandison."

Mrs. Brooke's novel consists of a series of letters from Emily Montague, at Sillery, to her friends abroad, and gives an admirable picture of the life of the period at Quebec, both in city and garrison. 1

Over half a century elapsed before anything further appeared, and to Upper Canada belongs the honour of having produced the second book of fiction written in Canada. This

1. The History of Emily Montague. In four volumes, by the author of Lady Julia Mandeville. London, Printed for J Dodsley, 1769. Vol. I. 140 p., Vol. II. 240 p., Vol. III. 223 p., Vol. IV. 213 p., 4 Vols. 12mo. This is the first edition. Another edition was published the same year at Dublin. It was translated into French by Robinet in 1770, (Amsterdam and Paris) and by Frenais the same year (Paris,) Another Dublin edition appeared in 1789; and another French edition at Paris in 1809. The original edition was dedicated to the then Governor, Sir Guy Carleton.

was "St. Ursula's Convent," 1. a mediocre story, belonging to the same general type which became so prolific and popular many years after in the hands of writers like "Ouida" and "The Duchess". The novel was published anonymously, but it subsequently appeared that the author was Mrs. Julia Catherine Hart, a native of Fredericton, New Brunswick, and who was living in Kingston, Upper Canada, at the time her novel was published. Mrs. Hart subsequently wrote a second book, a tale of Indian warfare and intrigue, entitled "Tonnewonte." 2

Major John Richardson, who may be regarded as the father of the historical novel in Canada, was born near Niagara Falls, Upper Canada, in 1797. He served in the war of 1812 and was taken prisoner, afterwards joining the British Legion in Spain, where he gathered material for one of his tales. In 1838 he returned to Canada, and devoted himself to literature and journalism. One of his romances, "Jack Brag in Spain", appeared in the *New Era, or Canadian Chronicle*, a newspaper which he had established at Brockville in 1840. His first book, however, appeared some years before this, "Ecarté, or the Salons of Paris", a novel published at New York in 1829, in two volumes. This was followed, in 1833, by his most important work, "Wacousta, or the Prophecy," a tale of Pontiac's war and of the seige of Detroit. Many of the scenes are laid in and around his boyhood home at Amherstburg. "Wacousta" was very favourably reviewed

1 St. Ursula's Convent, or, The Nun of Canada, containing scenes from Real Life In two volumes. Kingston, Upper Canada: Printed by Hugh C. Thompson, 1824, pp. 101, 132.

2. Tonnewonte, the adopted son of America. A tale, containing scenes from Real Life. By an American. Published for the trade. Exeter—B. H. Mader, 1831. pp 312.

M. Philéas Gagnon, the well-known French-Canadian blibliographer, has an interesting paper in the Transactions of the Royal Society of Canada, Vol. VI. Second Series, 1900-1901, entitled: "Le premier roman canadien de sujet par un auteur canadien et imprime en Canada." In this paper he gives a full description of these two early Canadian novels, and a sketch of their author, Mrs. Hart, (formerly Miss Julia Catherine Beckwith), who was born at Fredericton in 1796, and died in 1869.

Mrs Hart also wrote a third story, "Edith," which however was never published.

by such authoritative English journals as the *Athenæum* and *Satirist.* Richardson's third book, "The Canadian Brothers," is a vigorously written romance of the war of 1812, in which, as has been stated, he himself took a part. 1 This was followed by " Matilda Montgomerie," "Wau-na-gee; or the Massacre of Chicago", " The Monk Knight of St. John," "Westbrook," "Tecumseh," and one or two others, founded chiefly upon incidents in Canadian history.

In 1838 the *Literary Garland*, a monthly magazine "devoted to the advancement of general literature", was started at Montreal, and for some years edited by John Gibson. The magazine ran for fourteen years, an unprecedented thing in Canada, and was by all odds the most important venture of the kind in the country, up to that time. 2 Its contents were mainly fiction, from Canadian pens, among the chief contributors being Mrs. Moodie and Mrs. Traill, two of the famous Strickland sisters, Mrs. Leprohon, Hugh E. Montgomerie, Reverend Joseph Abbott, Mrs. Maclachlan, Fennings Taylor, Dr. William Dunlop ("Tiger" Dunlop, as he was called) of the Canada Company, Mrs. Cushing, Mrs. Cheney and Miss. Foster, the last three sisters.

Mrs. Susanna Moodie was born at Bungay, in the County of Sussex, England, in 1803. Four of her sisters, Elizabeth, Agnes, Jane and Catharine, contributed to the literature of the period, the first two being authors of the standard works "The Queens of England," "Queens of Scotland,"etc. Susanna Strickland began to write when she was fifteen years of age, contributing short poems and tales to English annuals and magazines. In 1821 she married Mr. J. W. Dunbar Moodie, and they came to Canada the following year, settling on a farm near Port Hope, afterwards removing to a place near Peterborough, in what was then practically the wilderness. In her best-known book, "Roughing it in the Bush," Mrs. Moodie has given a graphic picture of the hardships they had

1. Published at Montreal in 1840.

2. First Series, December 1838 to December 1842. New Series, 1843 to 1852. Published by Lovell & Gibson.

to undergo in their backwoods home. Her first book written after she came to Canada was "Mark Hurdlestone, the Gold Worshipper." 1 This was followed by "Flora Lyndsay," 2 "Matrimonial Speculations," 3 "Roughing it in the Bush," 4 "Life in the Clearings," 5 "Dorothy Chance," "The Monck-tons," 6 etc.

Mrs. Catharine Parr Traill, who died only a couple of years ago, having nearly reached the century mark, was born in England in 1805. 7 She emigrated to Canada in 1832, with her husband, Lieutenant Traill of the Scotch Fusiliers. They settled near Rice Lake, in Upper Canada, where nearly all her books were written. Besides several charmingly written books of science, which furnish delightful reading as well to the novice as to the naturalist, she was the author of a number of tales, among the chief of which may be mentioned "The Canadian Crusoes," 8 "Lady Mary and her Nurse," 9 and "Stories of the Canadian Forest." 10

Mrs. Rosanna Eleanor Leprohon was born and educated in Montreal. She contributed to the *Literary Garland* at the age of fourteen, and subsequently wrote a number of novels, romances and short tales, as well as some rather

1. Published 1852, in 2 volumes.
2. "Flora Lyndsay; or, Passages in an Eventful Life," 1854.
3. 1854.
4. "Roughing it in the Bush; or, Life in Canada," 1852.
5. "Life in the Clearings through the Bush," 1853.
6. 1856, 2 volumes.

Mrs. Moodie subsequently published a number of other novels and tales: "Hugh Latimer," "Rowland Massingham," "Adventures of Little Downey," "Soldiers' Orphans," "Over the Straits," "The World Before Them," 3 vols., and "George Leatrim," 1875. Mrs. Moodie died in 1885.

7. An interesting biographical sketch of Mrs. Traill will be found in the introduction to one of the last of her books, "Pearls and Pebbles; or Notes of an Old Naturalist."

8. Edited by Anges Strickland. Published by Hall & Vertue, London, and afterwards by Nelson & Son, Edinburgh. Ran through numerous editions.

9. Published 1850. Name afterwards changed to "Afar in the Forest." Many subsequent editions.

10. Published 1856.

The last book Mrs. Traill published, "Cot and Cradle Stories," appeared in 1895, when she was well on into her nineties.

mediocre poetry. Mr. Henry J. Morgan, in his "Bibliotheca Canadensis," says of her work in fiction—"She aimed principally to depict the state of society which existed in Canada prior to and immediately after the Conquest." Her first important novel was "Ida Beresford," which appeared in the *Literary Garland* in 1848. The following year "Florence Fitz Hardinge" appeared; and after these came in rapid succession, "Eva Huntingdon," "Clarence Fitz Clarence," "Eveleen O'Donnell," "Armand Durand," 1 "The Manor House of De Villerai," and "Antoinette de Mirecourt." 2 The last three, as well as the first, were afterwards translated into French. "Ida Beresford" was warmly praised by Mrs. Moodie in the *Victoria Magazine*, Belleville, of which she was then editor.

Turning now to the Lower Provinces, we come to a name which ranks head and shoulders above every other name in Canadian literature—Thomas Chandler Haliburton, "Sam Slick." Halibuton was born at Windsor, Nova Scotia, on the 17th December, 1796. He was educated at King's College, Windsor, graduating with honours; was called to the bar; and afterwards represented the county of Annapolis in the Provincial Assembly. In 1828, when only thirty-two years of age, he was appointed Chief Justice of the Court of Common Pleas of Nova Scotia, and in 1841 was transferred to the Supreme Court of that Province. In 1856 he removed to England and entered the English Parliament, where for several years he staunchly upheld Colonial rights in an assembly that, when not actively hostile, was indifferent on the subject. He died at his English home, Gordon House, on the banks of the Thames, in 1865.

It is impossibe to attempt to do even partial justice, within the limits of a general paper, to the work of one whom Artemus Ward pronounced to be the "father of the American

1. "Armand Durand; or a Promise Fulfilled," Montreal, 1868, 8 vo. Translated by J. A. Gênand, 1869.

2. "Antoinette de Mirecourt; or, Secret Marrying and Secret Sorrowing; A Canadian Tale" Montreal, 1864, pp. 369 12 mo.

school of humor." Haliburton was not only a genuine humorist, one whose humor never became forced, and whose satire was absolutely free from that vitriolic quality which mars the work of so many writers, but he also possessed most of the qualities which belong to the successful novelist. His skill in character-drawing has rarely been excelled on this continent, and his dialogue and power of graphic description are only slightly less marked.

Haliburton's first book, "The Clockmaker; or the Sayings and Doings of Samuel Slick of Slickville," appeared originally in the *Nova Scotian*, in 1835-36. The *Nova Scotian* was then edited by another famous native of the Province, Joseph Howe. "The Clockmaker" was published by Howe in a small volume in 1837. It has since gone through some twenty editions, and was translated into German in 1840. 1 In that year "The Letter-Bag of the Great Western" 2 appeared; and in 1843 "The Attaché; or, Sam Slick in England." 3 "The Old Judge," 4 came out in 1840, and was translated into both French and German, besides running through many editions in English. "Wise Saws and Modern Instances" 5 was published in 1853, in two volumes; and "Nature and Human Nature" 6 in 1855.

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1. The First, Second and Third Series of "The Clockmaker" were published by Richard Bentley, London, in 1837, 1838 and 1840 respectively. They were reprinted in 3 vols. 1838-43, in 8vo The first United States edition was that of Lee & Blanchard Philadelphia, 1837 Other editions followed: Concord, 1838 1839; Philadelphia, 1838, 2 vols; Paris, 1841; New York, 1841; London 1845; London, 1848; Philadelphia, 1857; New York, 1858; London, 1862; London, 1870; New York, 1872; London, 1878; London, 1884; New York, 1889. The German edition was published by Braunschweig.

2. "The Letter-Bag of the Great Western, or, Life in a Steamer." By the author of 'The Sayings and Doings of Samuel Slick.' Richard Bentley London, 1840. 8vo.

3. In 4 vols. Bentley, London, 12 mo. Other editions: London, 1849; New York, 1856; London, 1862; London, 1871. In Allibone's "Dictionary of Authors" a curious mistake is made, in speaking of this book "In 1842" says Allibone "the writer visited England as an *Attache* of the American Legation, and in the next year embodied the result of his observations on English Society in his amusing work "The Attaché." This, of course, is absurd. The only time Haliburton visited England was in 1856, when he made his home there permanently, and entered the British Parliament. As a Canadian and a British subject he could not possibly be an *Attache* of the American Legation.

The *Illustrated London News* of July 15th, 1842, contained a sympathetic review of Judge Haliburton's work, from which the following is taken:

"The primary cause of its success, we conceive, may be found in its sound, sagacious, unexaggerated views of human nature—not of human nature as it is modified by artificial institutions and subjected to the despotic caprices of fashion, but as it exists in a free and comparatively unsophisticated state, full of faith in its own impulses, and quick to sympathise with kindred humanity; adventurous, self-relying, untrammelled by social etiquette; giving full vent to the emotions that rise within its breast; regardless of the distinctions of caste, but ready to find friends and brethren among all of whom it may come in contact.'

"Sam Slick" has found his way into every corner of the earth. A traveller records his surprise and pleasure at meeting with a well-thumbed copy in a log hut in the woods of the Mississippi Valley. Another traveller found one in the most northern town in the world, Hammerfest, Norway, where it was the constant companion of the British Consul. Forty years ago it is recorded that an able but very eccentric Danish Governor at St. Thomas, in the West Indies, was noted far and wide for his excessive admiration for "Sam Slick" and his sayings. Whenever a very knotty point arose before him and his Council, which consisted of three persons, he used to say, "We must adjourn till to-morrow. I should like to look into this point. I must see what Sam Slick has to say about it."

As Nova Scotia had her pre-eminent man-of-letters, so New Brunswick might also boast of her's, though on a lower

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4. "The Old Judge; or, Life in a Colony." By the author of "Sam Slick the Clockmaker." 2 vols. Henry Colburn, London, 1849, 8vo. Appeared originally in *Frazer's Magazine*, Feb. 1847. Other editions: New York. 1849; London, 1860; New York, 1862; New York. 1880 Translated into German in 1849-50 and published in 3 vols. French translation, "Le Vieux Juge," *Bibliotheque Universelle de Geneve*, Tom. x, 1849.

5 Sam Slick's Wise Saws and Modern Instances; or, What he Said, Did, or Invented," 2 vols Hurst & Blackett, London. 1853, 8vo. Other editions: Philadelphia. 1853; London, 1859.

6. "Nature and Human Nature. By the author of Sam Slick the Clockmaker, 2 vols. Hurst & Blackett, London, 1855, 8vo. New York, 1855; London, 1859.

A book wrongly ascribed to Haliburton in the "English Catalogue." Morgan's "Bibliotheca Canadensis," etc., is "Kentucky. A Tale" London, 1834. It is simply an English edition, with a different title, of James Hall's "The Harpe's Head, a Legend of Kentucky." 1833

plane than Haliburton. James De Mille was born at St. John, New Brunswick, in 1834, and died in 1880. He was educated at Acadia College, Wolfville, and at Brown University. From 1860 to 1865 he filled the important Chair of Classics in the faculty of Acadia, and was afterwards Professor of History and Rhetoric at Dalhousie College, Halifax. He was the author of some twenty or thirty novels and tales, all published in the United States. The Harpers brought out some of his best books, "The Dodge Club," "Cord and Creece." [1] "The Cryptogram," [2] "A Strange Manuscript Found in a Copper Cylinder," [3] etc. Several of these first appeared in *Harper's Magazine* as serials.

De Mille's first book was "Helena's Household," a story of the catacombs at Rome, in the days of the persecution of the Christians. "The Dodge Club" was published in 1869, some months before the first appearance of Mark Twain's "Innocents Abroad." It is a curious coincidence that two books, so similar in arrangement and style of humor, should have appeared the same year. There can be no possibility that one borrowed from the other, for De Mille's book appeared before "Innocents Abroad," and it would be absurd to suppose that a writer of Mark Twain's superabundant humor and intellectual resource could have the slightest occasion to pick another man's brains. While on the subject of coincidences, it might be noted that "The Clockmaker" first appeared in 1835, some months before "Pickwick Papers." Anyone who has read the two books must have been struck with their marked resemblance both in plan and treatment. As it actually has been charged against both Haliburton and De Mille that they borrowed from Dickens and Mark Twain respectively, it is important to lay emphasis on the fact that in each case the Canadian book appeared first.

Although Mrs. Scott Siddons selected it for one of her readings, and was enthusiastic in its praise, "The Dodge

1. Published, 1869
2. Published, 1871.
3. Published, 1888, after his death.

Club" hardly comes up to the level of "Innocents Abroad." It does not possess the overmastering appeal of Mark Twain's book, though its humor is as true, and the narrative equally bright and entertaining.

James De Mille's novels did not in any case represent the best work of which he was capable. He was always an extremely busy man, and his books of fiction were written at night, after the fatiguing work of the lecture room had been gone through He himself called them mere "Pot-boilers," and looked forward to a period of comparative l isure, when he might produce the best that was in him. He died, however, in the prime of life, before his dream could be fulfilled.

Personally he was a most charming companion, a genial and entertaining talker among his friends, a musician and artist of more then ordinary skill, and a remarkable linguist. He read and spoke nearly all the languages of Europe, understood Latin, Greek and Anglo-Saxon, and had a working knowledge of Arabic and Sanskrit. He had wandered into every road and by-way of English literature, and enriched a text-book on Rhetoric which he prepared with such a wealth of illustrative passages from the English classics as will hardly be found elsewhere. 1

From about 1860, when the last of Major Richardson's books appeared, no book of fiction of any consequence came out in Upper Canada, (or Ontario,) until the year 1874, when Miss Agnes Maule Machar, of Kingston, a friend of Whittier's, publishsd a little tale called "For King and

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1. The following is a fairly complete list of Professor De Mille's books of fiction, besides those mentioned above: "Martyrs of the Catacombs," 1858; "Andy O'Hara," 1860; "John Wheeler's Two Uncles," 1860; "The Soldier and the Spy," 1865; "Arkansas Ranger," 1865; "The Lily and the Cross," 1874, 1893; "Lady of the Ice," 1870; "An Open Question," 1872; "The American Baron," 1869; "The Living Link," 1874; "A Comedy of Terrors," 1872; "The Babes in the Wood," 1879; "A Castle in Spain," 1883. The dates of publication are those given in Allibone's "Dictionary of Authors," but their absolute accuracy is problematical, as MacFarlane in his "Bibilography of New Brunswick" gives different dates in nearly every instance, while he, again, is not sure of some of his own dates.

Country." This is a story of the War of 1812, giving not only an excellent picture of the chief operations in the Niagara Campaign, but also containing several charming descriptive passages of the scenery of the Peninsula Miss Machar has since written a number of other novels and tales, chiefly appealing to juvenile readers. She is also the author of a volume of very fair verse.

In 1877 Mr. John Talon-Lesperance, of Montreal, published a story of the American invasion of Canada in 1775-76, under the title "The Bastonnais." This book was afterwards translated into French.

In the same year William Kirby's historical romance, "Le Chien D'Or," appeared, in an unauthorized American edition. Several subsequent editions were published in the United States, also without the author's consent, and it was not until as recently as 1897 that the first authorized edition appeared, from the publishing house of L. C Page & Co., of Boston, under the title "The Golden Dog." It is a curious, and not very creditable, fact, that this novel, which ranks among the best written by a Canadian, has never yet appeared in a Canadian edition.

Mr. Kirby's romance is founded on an ancient tablet, containing an inscription surmounted by a golden dog. The tablet originally stood in the face of a building in the city of Quebec, dating from before the Conquest. When the building was pulled down in 1871, the tablet was removed and placed above the entrance to the Post Office, where it may still be seen. From the legend connected with this tablet, and from the love-affairs of the notorious Bigot. Intendant of New France, Mr. Kirby constructed his fascinating romance.

Sir James LeMoine mentions a pleasing incident in connection with "The Golden Dog.' It appears that Kirby was presents as a member of the Royal Society of Canada, at the At Home given to the Society in 1883 by its founder, the Marquis of Lorne. After some of the leading members of the Society had been presented, the Princess Louise sent

an Aide-de-Camp to Mr. Kirby, and after he had been presented to her, conveyed to him publicly the Queen's thanks for the pleasure Her Majesty had felt in reading his book. This incident is noticeable not only as a personal tribute to Mr. Kirby, but also as marking in a peculiar degree the thoughtfulness and tact for which the late Queen was so justly noted.

Another interesting point in connection with Mr. Kirby's novel may also be mentioned. It is embodied in the following letter, which I received a short time since from Mr. G. Mercer Adam, a Canadian man-of-letters, now editing the American edition of the "Encyclopædia Britannica," and who was for some years editor of the *Canadian Monthly*, Toronto:—

"Early in 1878" (he writes) "I was instrumental in bringing out William Kirby's Canadian romance, "Le Chien D'Or," which was founded on the legend related by J. M. LeMoine in his "Maple Leaves." The London *Graphic*, in an issue subsequent to this published a novelette with the same name, contributed by Besant and Rice, when these writers were working their literary partnership. About this time a number of piracies of Canadian things had been appearing in England, owing to the then absence of an international copyright. Among these unacknowledged reprints was the episode in regard to Lord Nelson related be LeMoine in "Maple Leaves," and other things. Being interested as a Canadian writer and publisher I wrote a letter protesting against these delinquencies, which was published in the Toronto newspapers as well as in the London *Athenæum* In that letter I gibbetted Besant and Rice among the latter delinquents, who, as I conceived, had just boiled down Kirby's romance and made a novelette of it for the *Graphic*, and this without a word of acknowledgment. I was by no means alone in conceiving that the *Graphic* novelette was a plagiarism; not only Kirby, the author of the story, was convinced of the theft, but LeMoine of Quebec was also of this opinion, and when my *Athenæum* letter appeared he was about to write showing up the appropriation in the London *Times*. Of this he tells me in a letter from him in my possession, dated September 24th, 1878. He calls Besant and Rice's novelette a 'clumsy, pale copy of a good original—Kirby's 'Chien D'Or,'" and adds that if Besant and Rice's denial that they had ever seen the latter is to be accepted, "then a curious literary coincidence must be accounted for." Well, the English novelists threatened legal action and cabled this information over, promising to send by mail a categorical denial of my charge. To meet this and defend myself I prepared a careful and lengthy statement enumerating all the points of resemblance between Kirby's book and their novelette, and my statement appeared in the Toronto *Globe* and *Mail*, occupying some columns in length, on or about September 22nd, 1878. Of course, as a gentleman, I was bound to accept their denial, and I closed by withdrawing my statements, and the suit fell to the ground The points I made, however, were so convincing that everyone believed that I had hit the nail on the head, and that the English novelists (Rice especially) were the culprits I had taken them to be. Rice, Dr. S. E. Dawson—then a publisher in Montreal—afterwards told me, was in Canada the previous summer, and had asked for any recent native literature, which he took home with him."

"The Golden Dog" has been twice translated into French, once by Mr. Louis Fréchette, and again by Mr. Pamphile LeMay, both of them very prominent in the French-Canadian world of letters. Mr. LeMay had already won even higher merit as a translator by his fine rendering into French of "Evangeline," which won the warm praise of Longfellow himself.

In 1886 a romance entitled "An Algonquin Maiden," by Miss Ethelwyn Wetherald and G. Mercer Adam, was published at Toronto. It deals in a vivid and picturesque manner with the critical period in Upper Canada between the War of 1812 and the Rebellion of 1837. A new edition is said to be in contemplation by a Toronto publisher.

Mr. Gilbert Parker may very properly be regarded as Canada's leading novelist, whether we consider him merely among his contemporaries, or with the whole group of Canadian novelists. He is *not* to be compared with Haliburton, for Haliburton, though, as has been pointed out, his books reveal the essential qualities of a true novelist, was first and foremost a humorist.

Mr. Parker was born at Camden East, Ontario, in the year 1862. He studied at the Normal School, Ottawa, and at Trinity College, Toronto, where he was also for a time Lecturer in English Literature He went to Australia shortly afterwards, owing to ill-health, and became associate editor of the *Morning Herald*. He travelled extensively among the South Sea Islands, embodying the result of his observations in a book of travel, "Round the Compass in Australia." While there he also wrote several plays, "The Vendetta," "No Defence," and an adaptation of "Faust." He subsequently returned to Canada and travelled extensively in the North-West, where he gathered materials for several of his sub-

1. For a full account of the "Golden Dog" legend, see Sir James LeMoine's "Maple Leaves," 1873, p. 89.

The legend referred to above is as follows:

"Je suis un chien qui ronge l'os,
En le rongeant, je prends mon repos;
Un temps viendra qui n'est pas venu,
Que je morderai qui m'aura mordu."

sequent books. He afterwards removed to England, which has since been his home.

His first novel, apart from short-stories, was "Mrs. Falchion," published in 1893. The scene is laid partly in Western Canada and partly in the Far East. In nearly all his subsequent romances the scene is laid entirely in his native country. His second novel was "The Trespasser;" [1] which was followed by "The Translation of a Savage," [2] in which an Englishman marries a beautiful young Indian girl, and carries her back with him to his English home, with unhappy results to her. "The Trail of the Sword," "When Valmond Came to Pontiac," [4] "The Seats of the Mighty" [5] and "The Pomp of the Lavilettes," [6] followed in rapid succession, marking an almost continuous improvement in the author's style and in the symmetrical treatment of his theme. "The Trail of the Sword" has since been translated into French, and "The Seats of the Mighty" has been successfully dramatized. In 1898 he published "The Battle of the Strong," undoubtedly the strongest and most sustained piece of work he has yet put forth. The scene is in the Island of Jersey and in France; the plot is intensely dramatic and skillfully developed; and the characters are drawn with an assured touch

In a recent letter Mr. Parker tells me that he has completed a new Canadian novel, as well as another dealing with modern life in Egypt. He has also written a number of sketches of Anglo-Egyptian life, some of which have appeared in English and American magazines, and others are to follow. It is to be hoped that Mr. Parker's new duties in the British Parliament will not be allowed to interfere with his value as a man-of-letters. [7]

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1. Pub. 1893; 2. 1894; 3. 1894; 4. 1895; 5. 1896; 6. 1897.

7. Since this paper was read Mr. Parker has brought out the new Canadian novel referred to above. It is entitled "The Right of Way," published 1901, and shares with two other Canadian books of fiction (by Seton-Thomson and "Ralph Connor") the distinction of heading the list of most popular books, in the United States publishers' lists and library reports, in December, 1901. The plot is of the "Enoch Arden," type, and very finely worked out.

Mr. Charles G. D. Roberts is a man of exceptionally wide intellectual activity. He was educated at King's College, Windsor, Nova Scotia, the same venerable institution from which graduated Haliburton and many others who have left their mark on Canadian literature or public life. Mr. Roberts subsequently filled the chair of English Literature at King's College for several years. He afterwards edited the Toronto *Week*, and was for a time associate editor of the New York *Illustrated American*. Of late years he has devoted himself entirely to literary work. Even before he left college Mr. Roberts had begun his literary career. His first book of verse was published about this time, and it was followed at intervals by some half dozen other volumes of poetry, the best of which he is about to re-publish in a Collected Edition. 1 He has also found time to write an excellent "History of Canada," a Canadian Guide-Book, and, what we are more immediately concerned with, several books of short-stories, and a series of historical romances.

His first romance was "The Forge in the Forest," published in 1897, and this was followed by "A Sister to Evangeline," which is in the nature of a sequel to the first book. The scene of both novels is laid in Nova Scotia, in the days when the Acadians were still tilling their dykelands around Grand Pré, and the Black Abbé was plotting for the overthrow of English authority in the Province. These stories are excellent examples of that very popular type of fiction—the historical novel. No one is more competent to write authoritatively and entertainingly of the romantic incidents of early days in Nova Scotia, than Mr. Roberts. In these books he has charmingly combined the varacity of the historian with the imagination of the novelist. They are among the best books of the kind that we have yet had in

1. Published in 1901. It embodies an excellent selection of his verses, through one would perhaps have liked to see a few more of the earlier poems.

Canadian fiction. [1]

During the past few years a number of new historical romances have been written and published by Canadian writers, but it will not be possible to do more than touch upon them in the briefest possible way.

"The False Chavalier," [2] by W. D. Lighthall, of Montreal, is a very readable romance of New France; and the way in which it came to be written is almost as romantic as the story itself. It appears that a bundle of ancient papers was accidentally discovered in an old manor-house in the Province of Quebec, and these, coming into Mr. Lighthall's hands, were worked into the present fascinating story.

Another Montreal novelist is Mr. William McLennan, whose first book, "Spanish John," [3] had a somewhat similar origin to that of Mr. Lighthall. "Spanish John" is a tale of the days when the Young Pretender was making a last desperate effort to regain the throne of his fathers. The scene is laid partly in Scotland and partly on the Continent. Mr. McLennan's second book, "Span O' Life," [4] written in conjunction with Miss Jean N. McIlwraith of Hamilton, Ontario, is placed in that romantic period of Canadian history surrounding the final conflict between France and England for the mastery of the New World. The story gives a vivid and convincing picture of the time, and covers both the Louisbourg Seige and also the final Seige of Quebec. [5]

Miss Blanche Lucile McDonell, of Montreal, brought out in 1898 a romance of French Canada entitled "Diane of Ville-Marie." The scene is laid in Montreal in the days when Frontenac was Governor of New France, and the gigantic and

1. Mr. Roberts has completed a new historical novel entitled "Barbara Ladd," the scene of which is placed in the same picturesque province by the sea.

2. 1889.

3. New York, 1898.

4. New York, 1899.

5. Miss McIlwraith has since brought out a novel of her own, "The Curious Career of Roderick Campbell," Boston, 1901. This is an historical novel, of the days before the Conquest of Quebec.

masterful Dollier de Casson ruled the spiritual destinies of Ville-Marie.

"Marguerite de Roberval," [1] by Mr. T. G. Marquis, Principal of the Collegiate Institute at Brockville, is a romance of the days of Jacques Cartier. It is founded on a picturesque old legend, which the early French-Canadian historians gave credence to, but which Parkman would not vouch for. The legend was to the effect that Roberval on his final voyage to New France brought with him his beautiful niece, Marguerite. Her lover slipped on board the vessel without Roberval's knowledge or permission, and in fact against his express command. His discovery led to a violent scene. Subsequently, malicious friends came to Roberval with scandalous tales involving Marguerite and her lover. Roberval's rage now knew no bounds, and embraced Marguerite as well as her lover. He left them unpunished until the vessel reached a bleak, uninhabited island, somewhere near the Straits of Belle Isle, called suggestively the Isle of Demons. Here he put them ashore with a few provisions, and abandoned them to their fate. In some versions of the story Marguerite's old nurse was permitted to accompany her unfortunate mistress. The tragic history of their life on the desolate and haunted island, furnishes the substance of Mr. Marquis's romance. Marguerite is finally left the sole survivor, is rescued by a passing vessel, and carried back to France, where she tells her pitiful tale to the nuns of a friendly convent. The same story has been graphically told in a long narrative poem, by the late Mr. Geo. Martin, of Montreal. Colonel Hunter-Duvar, the Prince Edward Island poet, also worked it into his drama "Roberval." It will be found, in a somewhat different form, in the famous collection of tales, "The Heptameron," of Marguerite of Navarre.

Mr. Edgar M. Smith, is the author of an historical romance entitled "Aneroestes the Gaul," [2] which has been

1 London, 1899.

2. Fisher Unwin, London, 1898. Grafton & Son, Montreal.

warmly praised by several leading English reviewers. It deals with the period of Hannibal's invasion of Rome—the Second Punic War, and is not only a graphic and forcible story of that famous campaign, but reveals a surprisingly close knowledge of the period. It is almost more valuable as a fragment of history than as a romance.

Miss Agness C. Laut, of Ottawa, published a few months ago a romance of the early days in the great North-West, when the hitherto all-powerful Hudson's Bay Company was fighting for its existence with the young and vigorous Canadian company of the North-West. Her book is entitled "Lords of the North," [1] and is the first attempt to put the records of this period of Canadian history into the form of romance.

"With Ring of Shield," [2] by Mr. Knox Magee, of Toronto, is a stirring tale of the days of the Hunchbacked King, Richard the Third of England.

There are several other books in Canadian fiction which, although not historical in subject, partake more of the nature of the romance than the novel. Such a one is Mrs. Harrison's "Forest of Bourg-Marie," [3] which Robert Barr has so deservedly praised in a recent article. It is the only sustained story which we have of modern life in French Canada, and is on the whole remarkably true to life, and a strong piece of work both as regards matter and style.

Another book of the same class is "Rose à Charlitte," [4] by Miss Marshall Saunders of Halifax. This is a romance of modern life, the scene of which is laid on the Nova Scotia coast of the Bay of Fundy, among the homes of the modern Acadians. Miss Saunders, is also the author of several other books of fiction, "Beautiful Joe", which was published several years ago, and reached a circulation of about half a million

1. Briggs, Toronto, 1901. Miss Laut has since completed a second historical novel, "Heralds of Empire."

2 Toronto. 1900. Mr. Magee has since published "Mark Everard," (1901) a romance of Elizabethan England.

3 Morang, Toronto, 1898.

4. Page & Co, Boston, 1898.

copies in the United States and Canada, and has been translated into German, Swedish and Japanese; "Deficient Saints,"[1] a novel of New England life and character; "Her Sailor,"[2] a modern love story, enlarged from an earlier book "Her Spanish Sailor"; and several other shorter stories, appealing rather to juvenile than adult readers.

Miss Lily Dougall, of Montreal, is the author of a number of novels, all of them of good quality. Her first book, "Beggars All," was published in 1891, and was highly praised by the London *Academy* and other authoritative journals. This was followed by "What Necessity Knows" (1893), "The Mermaid," (1895) "Zeit Geist," (1895) a rather remarkable departure in fiction, which created something of a sensation when it first appeared, "A Question of Faith," (1895), "The Madonna of a Day," (1896)[3] "A Dozen Ways of Love," (1897) and "A Mormon Prophet".[4] The last puts into the form of a novel the early history of the Mormons and of the remarkable man who founded that sect. Several of the other books have their scenes laid in Canada.

Mr. Grant Allen, who died in England about a year ago, was, as of course everyone knows, a Canadian by birth. He spent the greater part of his life, however, in England, and his books are in no sense Canadian, either in tone or theme. So far as his novels are concerned, perhaps we need not be over anxious to claim them in any event. He was much more brilliant, edifying, and successful, and one might also say, much more entertaining, as a scientific writer than as a novelist.

Mrs. Everard Cotes (formerly Miss Sara Jeannette Duncan) was born in Brantford, Ontario, and spent the first twenty years or so of her life in her native country. Her home is now in Simla, India, where her husband is a practicing physician. She has devoted herself to the writing of fiction

1. Page & Co., Boston, 1899.
2. Page & Co., Boston, 1900.
3. Appeared originally in *Temple Bar*.
4. Toronto, 1899.

for the past ten or twelve years. Aa a Canadian novelist she stands almost in a class by herself. Her books — or at any rate the best of them — are instinct with a certain quiet humour, which is all her own, and which is as rare as it is enjoyable. Her first, and best, book, was "A Social Departure," published in 1890.[1] In this she tells in a charmingly fresh and original manner the adventures of herself and one Orthodocia, in their unchaperoned journey around the world. The book is something akin to DeMille's "Dodge Club" in plan and humour, and might also be classed with Grant Allen's "Miss Cayley's Adventures" and Robert Barr's "Jennie Baxter, Journalist", but it appeals to the present generation more keenly than "The Dodge Club", and is vastly superior, both in narrative and in the quality of its humour, to the other two. Some of the scenes, such as the Japanese reporter's interview, and Orthodocia's experience in a Japanese bath-tub, are quite irresistible.

Her second book was "An American Girl in London,"[2] which sufficiently describes itself. It is almost as amusing and entertaining as its predecessor. This was followed by "The Simple Adventures of a Memsahib," "Vernon's Aunt,"[3] "The Story of Sonny Sahib," "A Daughter of To-day," "His Honour and a Lady," "A Voyage of Consolation," and "The Path of a Star".[4] The last book is much inferior to Mrs. Cotes' earlier work, and is a disappointment to those who have learned to look for something above mediocrity from her.

Robert Barr began his literary life as a humorist, writing for the *Detroit Free Press* under the pen-name of "Luke Sharp." He afterwards drifted into short-stories, and from that into novels and romances, and his last published book is an entertaining volume of travels in the Mediterranean.[5] His literary career has thus been a varied one.

1. "A Social Departure; or How Orthodocia and I went Round the World by Ourselves." London, 1890.
2. Published originally in the *Ladies Pictorial*, London.
3. 1895. 4. 1899.
5. He has recently completed a volume of short stories, "The Merry Monarch," narrating the romantic adventures of one of the Scottish Kings.

His first book was entitled "Strange Happenings," and was published in 1882, before he had left his boyhood's home in Ontario. He offered the manuscript to all the leading newspapers of the province, but they would not look at it. He then tried the *Detroit Free Press*, which not only accept it, and what is more to the point, paid generously for it, but offered him a position on the staff of the paper. "Strange Happenings" consists of a humorous account of a voyage in a small boat around the southern shore of Lake Erie. It is not unlike Jerome K. Jerome's "Three Men in a Boat" in style and plan. Possibly there existed some unconscious affinity between them, for we find in after years the two novelists joining in the establishment of that amusing little monthly, the London *Idler;* which, by the way, has sadly degenerated, in other hands, from the brightness and humour of its first numbers.

In 1892 Mr. Barr published "In a Steamer Chair," and after that, "From Whose Bourne," (1893), "The Face and the Mask," (1894), "In the Midst of Alarms,"—a humorous account of the Fenian Raid in the Sixties—(1894), [1] "A Woman Intervenes," (1896), "The Mutabe Many," (1896), "One Day's Courtship,' (1897), and "Tekla" (1898.)

A couple of years ago a modest volume made its appearance in Toronto, under the title "Black Rock." [2] Being unassuming, it did not at first attract much attention. Its publishers were, fortunately, not of that enterprising type which announces a hundred-thousand edition before the book is on the market. "Black Rock" was therefore left to make its own way in the world, as any good book should, and its subsequent success is a striking tribute to the soundness of public taste. Slowly but surely the book gained ground, as one reader recommended it to another, until "Black Rock" became recognized as one of the strongest books of the year.

1. Mr. Barr was a Canadian volunteer at the time of the Fenian Raid.

2 Black Rock. By Ralph Connor, Toronto. The Westminister Company, 1898 New edition, Toronto, 1899, with an introduction.

And yet it had no artificial boom; no heralding of its merits to an expectant world; and it was moreover quite free from any tinge of sensationalism, to appeal to the jaded taste of a public surfeited with new fiction. The author's name given on the title-page was Ralph Connor, but this soon became recognized as a non-de-plume, and it leaked out that the author was Rev. C. W. Gordon, of Winnipeg, a missionary of the Presbyterian Church.

The origin of "Black Rock" was as modest as its appearance. It seems that Mr. Gordon, anxious to raise funds for his mission in the far west, discussed the matter with the editor of the *Westminster*, a Toronto magazine. The editor suggested that he should put his appeal before the public in the popular form of fiction, and Mr. Gordon, after some hesitation, agreed to this, and sent to the *Westminster* a sketch of a mining camp in the Rockies, such a camp as formed the scene of his own missionary labours. This afterwards became the first chapter of "Black Rock," and was followed by others, until the story was completed. It is not particularly well constructed, so far as plot is concerned, but this weakness is more than redeemed by the freshness and originality of its treatment. It is a strong, sincere, and very dramatic piece of work—altogether one of the best bits of fiction produced by a Canadian.

A beautiful little idyl of the Foot-hills of the Rockies, called "Beyond the Marshes," was Mr. Gordon's next contribution to Canadian literature. This sketch was prefaced by a sympathetic introduction, by the Countess of Aberdeen.

In the "Sky Pilot"[1] Mr Gordon changed his scene from the Pacific Slope of the Rockies to the foothills and plains on the eastern side of the mountains—somewhere in the neighhood of Calgary or Fort McLeod. This book has, if anything, had a wider success than "Black Rock," and the two books have reached an enormous circulation in the United

1. The Sky Pilot A tale of the Foothills. By Ralph Connor. Toronto. The Westminster Co., 1899. New ed. 1899.

States and Canada, and are beginning to make headway in England,—always an uncertain field for trans-atlantic books.

Two sisters, the Misses Lizars, of Stratford, Ontario, brought out a few years ago a couple of remarkably interesting and attractively written books, the first called. "In the Days of the Canada Company," and the second, "Humours of '37." They are, as their titles imply, contributions to the early history of Ontario, but have none of the dry-as-dust quality of conventional histories. Since the appearance of these two books, the sisters have again collaborated upon a book of fiction, "Committed to His Charge," [1] a simple story of village life in Ontario, graphically told, and with not a little quiet humour. The story is something in the manner of Mrs. Gaskell's "Cranford."

Another Canadian book of the same class is "Baldoon," [2] by the Rev LeRoy Hooker, a Canadian clergyman now living in Chicago. This book is perhaps more closely akin to Barrie's "Window in Thrums" than to "Cranford," the humour being essentially Scotch in tone. Mr. Hooker also wrote another book, "Enoch the Philistine."

Miss Joanna E. Wood, of Queenston, Ont, is the author of several books of fiction. The first two, "The Untempered Wind," (1894), and "Judith Moore," (1898), are novels of rural life in Ontario. The third, lately published, "A Daughter of Witches" (1900), is a rather clever study of character as found in a New England environment. Miss Wood has completed a fourth book "Farden Ha!," the scene of which is laid in Scotland, and which promises to be the best she has yet written.

A new type of fiction has lately become popular with Canadian novelists. It aims to bring the life of what we call the "lower animals" sympathetically before human readers. The idea is not an entirely new one, for Kipling, (to cite no earlier examples), introduced it very successfully in his Jungle

1. Morang, Toronto, 1900.
2. Chicago, 1899; Toronto, 1900.

Books. The Canadian stories, however, are sufficiently different in treatment, scenery, and in the animals they introduce, to appeal with something of novel force to present-day readers.

The first and best of these animal books is Mr. Ernest Seton-Thompson's "Wild Animals I Have Known." [1] Since the publication of this delightful collection of animal tales, Mr. Seton-Thompson has brought out two additional stories, the first entitled, "The Trail of the Sand-Hill Stag," [2] and the second, "The Biography of a Grizzly." [3]

Another book of the same class is Mr. W. A. Fraser's "Mooswa, and Others of the Boundaries," [4] which first appeared as a serial in the *Canadian Magazine*. Mr. Fraser has completed a new animal story, "The Outcasts," [5] which is to be published this year.

Mr. Charles G. D. Roberts has also entered the same field with his "Heart of the Ancient Wood," (1900), in which, however, the human element is introduced more freely than in any of the other animal stories.

All of these books are good in their way, and each contains sufficient originality to save it from any suggestion of plagiarism, either in matter or ideas, but there is a possibility that if the thing be carried too far the public will grow tired. It is a familiar phenomenon in the book world that when one man makes a success of a new departure in fiction, others immediately rush in to gather the after-math, until the type becomes a positive bore. Already a dozen or more American writers have taken advantage of Seton-Thompson's phenominal success, to force upon the market more or less crude attempts in the same direction.

The field of juvenile fiction has been by no means neg-

1. Scribners, New York, 1898.
2. New York, 1899.
3. New York, 1900. Mr. Seton-Thompson has since published another collection of animal-stories, "Lives of the Hunted," New York. 1901.
4. New York, 1900. Briggs, Toronto, 1900
5. New York, and Toronto, 1901.

lected in Canada, but it is impossible to more than touch upon it here. Two or three successful writers of boys' stories may be mentioned in passing.

James DeMille, whose work in fiction has already been dealt with, brought out a number of excellent boys' bo ks, in two series, "The B. O. W. C." (Boys of Wolfville College), [1] and "Young Dodge Club," [2] the former in six volumes, and the latter in three. Most of these books have run through several editions.

Mr. J. Macdonald Oxley, who has devoted himself almost exclusively to this class of fiction, promises to be almost as prolific a writer as the renowned Mr. Henty. Since the publication of his first story, "Bert Lloyd's Boyhood," in 1887, he has brought out some fifteen or sixteen books of adventure, all good of their kind.

Mr. E. W. Thomson, until lately editor of the *Youth's Companion*, has done excellent work in this field.

It is interesting to note how very generally our Canadian poets have dabbled in fiction, and with, comparatively speaking, what scant success. Mr. Roberts has certainly produced some very fair romances and short stories, and he must be taken as an exception to the rule. Charles Heavysege, the old Montreal dramatist, whose splendid drama "Saul" received such warm praise from Longfellow, Hawthorne, Emerson, Bayard Taylor, and Coventry Patmore, once tried his hand at a novel, but the result, which he called "The Advocate," [3] was a most lamentable failure. John Hunter-Duvar, the Prince Edward Island poet, published a rather dainty piece of imaginative work, "Annals of the Court of Oberon," but the historical novel which he subsequently wrote, and thought to be the best thing he had ever written, is such a crude and tedious bit of fiction as no publisher would ever dream of putting on the market. It is still in manuscript. Archibald Lampman began an ambi-

1. Published 1869-1873.
2. Published 1871-1877.
3. "The Advocate; A Novel. Montreal, 1865. 8vo.

tious novel while at college, but gave it up after writing two or three chapters. Duncan Campbell Scott has published one little book of short stories, excellent so far as they go, but, up to the present, he has produced nothing more, at any rate in book form. Isabella Valancy Crawford, William Wilfred Campbell, [1] Jean Blewett, Frederick George Scott, Louis Fréchette, and others of our poets, have made random attempts at writing fiction, but apparently have regarded it rather as a recreation from the more serious work of writing poetry. This attitude, of course, never yet brought success, and never will. In fact, the qualities that go to make a successful poet rarely produce a successful novelist.

The short-story has been a very popular form with Canadian novelists, especially of late years. Most of our writers who have done more sustained work in fiction, have at one time or another attempted the short-story, not realizing, too often, that the short-story requires a distinct gift, and that it can no more be successfully written by *any* novelist, than a sonnet may be written by *any* poet, or a miniature painted by *any* artist.

Mr. Gilbert Parker has published, so far, three volumes of short-stories, "Pierre and His People," [2] (his first contribution to fiction), "An Adventurer of the North," [3] in which the adventures of Pretty Pierre are continued, and "The Lane that Had no Turning." [4] The scenery of the first two books is in the Canadian North-West, and the latter is placed in Quebec. Mr. Parker holds the unique position of having written the best short-stories as well as the strongest romances of all our Canadian novelists.

1. Since the above was written Mr. Campbell has written an excellent piece of fiction, for one of the leading London periodicals, and is now engaged upon a second novel; which in a measure tends to weaken the argument against poets as novelist.

2 Toronto, 1892.

3. Toronto, 1895.

4. Toronto, 1900.

The fascinating field of French-Canadian life and character, which Dr. Louis Fréchette has dealt with from the point of view of an insider in his "Christmas in French Canada," [1] has also been widely touched upon by English-Canadian writers. Among these may be mentioned E. W. Thomson's "Old Man Savarin," [2] Henry Cecil Walsh's "Bonhomme," [3] "In the Village of Viger," (1896), by Duncan Campbell Scott; "In Old France and New" (1900), by William McLennan; and G. M. Fairchild's, "A Ridiculous Courting." (Chicago, 1900.)

Other books of Canadian short stories are; "The Gerrard Street Mystery," (1888), by the late J. C. Dent, the historian; "Stories of New France," by Miss Agnes Maule Machar and T. G. Marquis; Mrs. Harrison's "Crowded Out," (1886); Robert Barr's "In a Steamer Chair," (1892), "The Strong Arm," (1899), etc.; "The Eye of a God," (1899) by W. A. Fraser; Roberts' "By the Marshes of Minas," (1900), etc.; "The Loom of Destiny," (1900), by Arthur J. Stringer; J. Try-Davies' "A Semi-Detached House," (1900); F. Clifford Smith's "A Lover in Homespun," (1896); Norman Duncan's "Soul of the Street," (1901), etc.

I am more than conscious that in the foregoing attempt to review Canadian fiction, I have taxed your patience to the utmost, and have done but very scanty justice to the wide field which I have attempted to cover. In spite of every effort to condense, what I hope has been shown to be a large and important branch of our national literature, this paper has grown to far greater proportions than was either desirable or expedient. When I tell you, however, that I have counted over two hundred and fifty authors in English-Canadian fiction alone, without counting the contribution of French-Canadian novelists,

1. Morang, Toronto, 1900.
2. Briggs, Toronto, 1895.
3. Briggs, Toronto, 1899.

and leaving out of consideration, as well, the mass of fiction by Canadian writers which has appeared in various magazines, but not in book-form, you will, I think, agree with me that the space here given to the subject of Canadian Novels and Novelists is not after all so very much out of the way.

Metrology.

By Otto J. Klotz.
Astronomer, Department of Interior.

[*Read March 22nd, 1901.*

The subject of metrology—the science of measuring—is very comprehensive, and has furnished a library of literature. In the present short paper it is intended to treat the subject in its relation to our own doings, past and present, and indicate the trend of the world towards the adoption of simple, rational units of weights and measures for the convenience of man.

To the question—what is a yard, what a pound? an answer would probably not be readily given. We will return to the question later.

A few words abont the origin of our weights and measures. Beginning with the present, and tracing them through the statutes to England, and there following the enactments through various reigns, we pass into Roman and Greek history, and are finally lost in historic darkness.

The reference to the earliest introductions of weights and measures we find in Josephus, where, in Book I, Chapter ii, he says: "And when Cain had travelled over many countries, he, with his wife, built a city named Nod * * * and was the author of measures and weights."

In a primitive people, the most suggestive measure is one that is most easily available, and for this purpose the human body furnished the most ready scale for linear measure. It is but necessary to mention the names to show how the body, or parts thereof, were used. We have the foot, the digit, or finger's breadth; the thumb, or inch; the nail, or from the

tip to the middle joint of the longest finger; the palm, as measured across the middle joints of the four fingers; the hand, clasped with the thumb uppermost; the span, thumb and little finger extended to the utmost; the cubit, a length from the elbow to the extended finger; the step; the pace, or two steps, and the fathom, or length of extended arms from the tips of the fingers. There was a generally recognized scale of proportion between the above measures.

It appears that the earliest systems of Chaldaea, Egpyt and Phœnicia were all based upon the cubit, as the standard unit measure of length.

The Greek foot, equal to two-thirds of the earliest Egyptian cubit, was introduced from Greece into Italy, and was there divided into twelve parts or unciae, according to the Roman duodecimal system. Our words inch and ounce are thus derived from the Latin uncia. The modern measure of the foot in the different countries of Europe, with its duodecimal divisions of 12 inches, has been generally derived from the Greek foot and the Roman foot, although the French foot, or pied du roi, is traditionally said to have been the length of Charlemagne's foot, as the English yard is said to have been the length of Henry the First's arm.

The modern standard unit of weight, the pound, is derived from and is supposedly identical with the ancient mina, which was the ancient unit of weight in Egypt, and also as the unit of measure of capacity by the weight of liquid contents of vessels.

One of the earliest English statutes (51 Henry 3, 1266) provided that the English penny, called the "sterling," should weigh "thirty-two grains of wheat, well dried, and gathered out of the middle of the ear," that twenty pence to make an ounce, and twelve ounces a pound. The statute of Edward I. (1305) provided that an inch contained "three barley corns laid end to end." Although the grain of wheat and the barley corn were the legal units, yet for the affairs of life, metallic weights, multiples of the former, were used.

The series of standard avoirdupois weight (7,000 grains to the pound) constructed in 1588 in the reign of Queen Elizabeth, by which all the commercial weights of England were regulated up to 1824, were derived from a 56-lb. (4 stones) avoirdupois standard of Edward. III (1327–1377). The Elizabethan standard yard is, too, the unit upon which the present Imperial yard is directly based, through the respective copies by Graham (1742), Bird (1760), Sheepshanks and Baily (1855).

By the Imperial Act of 1824, the standard yard of 1760 and the brass Troy pound of 1758, of 5,760 grains were made the units of measure, and declared to be the only "original and genuine standards," from which all other Imperial weights and measures were to be derived. The former were destroyed by the burning of the Houses of Parliament in 1834.

In the Act of 1824, referred to, a provision, based on scientific principles, but in this case unpractical, was made for the contingency of loss of the original standards. From experiments made, it was found that a cubic inch of distilled water, at 62° F., barometer at 30 inches, weighed 252·458 grains; and also that a pendulum vibrating seconds of mean time in the latitude of London, in a vacuum at the level of the sea, measured 39·1393 standard inches. Theoretically it was therefore comparatively simple, to find the length of a standard inch (hence yard) by means of a pendulum. Having a standard inch, the cubic inch would follow by its equivalent in water of 252·458 standard grains, and hence means obtained for the restoration of the standard Troy pound. However, when it became necessary after 1834 to obtain some material standards for again legalizing, the scientific men of the day decided upon furnishing the same by comparison with copies of the original (1824) standards,—and then, by Act of Parliament making such prepared measures the standards. By the Act of 1855, the Imperial pound (avoirdupois) of 7,000 grains was substituted for the former

standard Troy pound of 5,760 grains.

Reverting now to our question—What is a yard, what is a pound—it will become evident on a moment's reflection, that there is and can be only one single absolute material yard and pound in a country, and that is the particular marked bar and mass of metal described in the Act as being the standard yard and pound respectively. All other yards and pounds are derivatives and, as such, are approximations to the standards and are invested with errors, be they ever so minute.

By 42 Victoria, c. 16, s. 4, the Dominion standards of measure and weight are the yard, the pound, and the troy ounce, as represented by a certain bronze bar and platinum-iridium weights deposited at the Department of Inland Revenue, in the custody of the Minister of Inland Revenue.

All other Dominion weights and measures are derived from the above. The grain is declared the one-seven-thousandth part of a pound, the ounce the sixteenth part, hence epuivalent to 437½ grains, while the troy ounce shall contain 480 grains.

Careful reading of the statute will show that we have two different standard troy ounces. In the one section, the troy ounce is the weight of a certain mass of platinum-iridium, in the form of a truncated cone, marked "A" and deposited at the Department of Inland Revenue. Its absolute weight as expressed in some other unit is a matter of measurment and, as such, of approximation. By another section it is defined as being 480 grains, the grain being the one-seven-thousanths of the standard pound, as represented by the cylindrical mass of patinum-iridium, marked "A" deposited at the Department of Inland Revenue. The two definitions are incompatible. We cannot declare two material things as standards and at the same time declare an absolute numerical relationship between the two; *i.e.*, how many times one is the measure of the other. Hence, the material troy ounce, marked "A," above referred to, is quite unnecessary as a

standard, for the grain is a derivative of the standard pound.

Measures of capacity are based upon weight in the first instance, the gallon being declared as containing ten standard pounds of distilled water at 62° F., and with the barometer at 30 inches. The other measures of capacity are defined in terms of the gallon.

Turning now to our earliest records in Canada, we find that,

The first by-law regarding testing or standardizing instruments of measure, was passed on January 29, 1674, of which the following is a transcript :—

"Le conseil assemblé, auquel présidoit Monseigneur le gouverneur, et où étoient Messieurs de Tilly, Damours, Dupont, de Peiras et de Vitré, le substitut du procureur-général, présent.—

"Sur ce qui a été représenté au conseil par le substitut du procureur-général, que la différence qui se trouve entre les boussoles et instruments dont les arpenteurs se servent pour aligner et arpenter les habitations, produit diverses contestations entre les propriétaires des terres, réquerant qu'il y soit pourvu.

Le conseil a ordonné et ordonne que les arpenteurs mettront dans la quinzaine leurs boussoles et instruments d'arpentage entre les mains de Martin Boutet, professeur ès mathématiques, pour être par lui égalés, et ce fait, que les dits arpenteurs poseront quatre bornes en la grande place de la basse-ville de Québec, savoir: deux bornes sur le rumb-de vent nord-est et sud-ouest, et les deux autres sur celui du sud-est et nord- ouest, dont ils dresseront procès-verbal, duquel ils mettront une expédition au greffe de la cour, pour éviter les changemens qui pourroient arriver à l'avenir par la variation de l'aimant, lesquels alignements seront continués d'être suivis pour les concessions qui seront données au nom du roi, sans toutefois ôter la liberté aux seigneurs particuliers de donner

tels alignemens qu'ils désireront faire suivre sur les terres de leurs fiefs.

Ordonne aussi le dit conseil qu'il ne sera reçu aucun arpenteur à l'avenir qu'il n'aît au préalable fait conformer par le dit Boutet l'instrument dont il prétend se servir, aux boussoles des autres arpenteurs, déclarant tel dit conseil que le présent règlement èst seulement pour l'avenir, et qu'il n'entend rien changer en ce qui a été fait jusqu'à présent.

Et sera le présent réglement montré aux dits arpenteurs à la diligence du dit substitut à ce qu'ils n'en ignorent."

FRONTENAC.

From 'Edits et Ordonnances'
Vol. II pp. 53, 54.

The first law (by-law) concerning weights and measures in Canada, we find of date May 11, 1676.

Under "Réglemens généraux du Conseil Supérieur de Québec, pour la Police, du 11 mai, 1676."

"Le conseil assemblé où étoient Monseigneur l'intendant, les sieurs le Villeray, de Tilly, Damours, Dupont, de Lotbinière, de Pieras et de Vitré, conseillers, le procureur-général présent.

* * * * * * *

I. II. III. IV. Tous les poids et mesures, comme minot, demi-minot, boisseau, pot, pinte, aune demi-aune, chaînes, romaines, crochets, balances, et généralement tout ce qui est nécessaire pour la vente et achat des marchandises qui ne sont point marquées, le seront à la marque du roi, en présence du lieutenant-général de la prévôté de cette ville, par son greffier, auquel il sera payé cinq sols pour chacune marque, dont moitié sera et demeurera à son profit, et l'autre moitié au profit de la ville, dont le dit greffier tiendra registre et en rendra compte tous les six mois."

"DUCHESNAU,"

"*Intendant.*"

From "Edits et Ordonnances," Vol. II, pp. 65, 66.

The next official act with reference to weights and measures, we find in the ordinance of "Gilles Hocquart, Chevalier, Conseiller du Roi en ses Conseils, Intendant de Justice, Police et Finances en la Nouvelle-France."

The ordinance reads as follows :—

"Sur cequi nous a été représenté par les officiers de la prévôté de cette ville, que les aunes. poids et measures, qui servent dans le commerce, sont de grandeurs inégales et peu justes, ce qui est venu en partie, jesqu' à présent, de ce qu'il n'y avait point d'étalons sur lesquels les différentes mesures puissent être vérifiées, nous aurions en conséquence fait remettre au greffe de la dite prévôte, des aunes, poids et mesures de toute espèce que nous aurions fait étalonner conformément à la Coutume de Paris suivie en ce pays et étant nécessaire, pour le bien et avantage du commerce, que les poids, mesures et aunes des particuliers y soient conformes, et de faire un réglement de police à ce sujet, ainsi que nous l'avons partiqué pour la ville de Montréal. Nous ordonnons à tous marchands, négociants, boulangers, bouchers, cabaretiers, regrattiers et à toutes autres personnes, de quelque qualité et condition qu'elles soient, qui se mêlent du commerce dans l'étendue de cette ville et du governement, d'apporter au greffe de la dite prévôté, dans un mois pour tout délai, à compter du jour de la publication de notre présente ordonnance, toutes les aunes, poids et mesures, tant pour les grains que pour les liqueurs et autres marchandises et denrées, pour y être vérifiés sur les étalons déposés au dit greffe, et y être marqués d'une fleur de lis, à peine, contre les contrevenants, de dix livres d'amende, passé lequel temps, nous faisons très-expresses inhibitions et défenses de se servir d'autres mesures, aunes et poids, que de ceux qui auront été vérifiés et marqués, sous la même peine.

"Enjoignons aux officiers de cette ville, de tenir exactement la main à l'exécution de la présente ordonnance, et de confisquer, après le dit mois expiré, les diffréents poids, aunes et mesures qui ne se trouveront point avoir été vérifiés et marqués.

"Fait à Québec, le neuf août, mil sept cent trente-deux.

"HOCQUART."

From "Edits et Ordonnances,"
Vol. III., p. 463.

The first ordinance after the Treaty of Paris, Feb. 10, 1763, *i.e.*, after Canada became a British possession, was passed on September 3rd, 1764, which

"Doth hereby ordain and declare, That from and after the tenth day of October, one thousand seven hundred and sixty-four, all weights and measures used in this province shall be according to the standard of the Exchequer of England, and that the Receiver General of this province, as soon as may be, procure a set of measures, long, liquid and dry, and a set of brass weights and scales; and that until such weights and measures shall arive, the weights and measures of His Majesty's Custom House shall be the standard: And the Clerk of the Market for each town (to be hereafter appointed) shall procure therefrom a set of weights according to such standard, which shall remain with them as assay weights, and shall be marked with the letters G. III., R." Then follows provision that all tradesmen's measures must be stamped by the "Clerks of the Market."

(Signed) JAMES MURRAY,

Captain General and Governor-in-Chief of the Province of Quebec and Territories thereon depending in America, Vice-Admiral of the same, Governor of Quebec, &c.

From "Ordinances Quebec," 1764-67, pp. 13, 14.

In the following ordinance there are several interesting points besides the one on measure, that may be worth noting. The title is :—

"An Ordinance—Concerning Land Surveyors, and the Admeasurement of Lands." 30th April, 1785.

This is the first English ordinance or statute relating to surveyors. The chief provisions of the above ordinance are

that a meridian line is to be laid down by the Surveyor General, at or near Quebec, Montreal and Three Rivers, on which surveyors must annually test their instruments (compass) and report the variation (declination) to the Suveyor General.

All surveyors must undergo examination by the Surveyor General, and each must give bonds for the proper discharge of his duty. Chain bearers must be sworn too.

For boundary marks, stone monuments must be used between seigneury and seigneury "of the length of one foot and a half at least above the surface of the earth."

It may be mentioned that on the death of a surveyor his plans, field-books, &c., became public records of the Court of Common Pleas, and for five years the heirs received half of the fees collected for copies furnished.

For our present purpose, the important clause in this ordinance is: "That the land measures shall be the same as before the year of our Lord 1760, in all grants of seigneuries and concessions therein to that period."

From Ordinances—Province of Quebec, pp. 57 65.

Probably the earliest legislation in America pertaining to weights and measnres is the order of 5 March, 1623-24, of the general assembly of the colony of Virginia, whereby weights and measures used had to be sealed by officers appointed for that purpose. The standards were, of course, those of the mother country—England.

On December 23rd, 1834, the dry-goods merchants of Philadelphia passed a resolution abolishing the custom of giving "the breadth of a thumb over or more than 36 inches to the yard." Shortly aftewards the Board of Trade met, and considering the resolution of the merchants rather sudden, resolved that the thumbless yard come not into force before the following 1st March, so that people might prepare for it!

THE METRIC SYSTEM.

This system is the most simple, and the one approaching nearest to perfection of any ever devised by man. In con-

sequence, the large majority of the civilized nations, including Russia, have adopted it and are enjoying its many advantages and benefits. The only people outside of the pale of its benefits is the English-speaking race, represented by the British and Americans.

It is now a hundred and ten years since the famous committee compossd of Laplace, Lagrange, Borda, Monge and Condorcet, who were appointed at the instance of Talleyrand, presented its report, advocating the adoption of a metric system to the French Academy of Sciences. This action was taken to cleanse the Augean stables of defective and heterogeneous weights and measures.

There were two distinct principles which occupied those scientists iu devising a new system ; the one was that the fundamental unit should be based on some physical constant and therefrom always determinable, and the other that the base of the system should be ten, that is the decimal system. The constants which received consideration were the length of the second pendulum, of the earth's equator, and of the earth's meridian. As the seconds pendulum involved time besides length, it was discarded ; as the equator was not so available for measurement as a meridian, nor was there any reason for believing it to be more regular than a meridian, the latter—a quadrant—was chosen as the constant.

The quadrant was imagined to be divided into ten million parts, and one part was designated a meter. Theoretically, nothing remained to be done but to measure accurately the angular distance between two places on or near the same meridian, that is, their difference of latitnde, and also the linear measure between the respective parallels of latitude. Whatever ratio the difference of latitude bore to 90°, the linear measure would then bear to ten million. Hence the actual measure or length of the meter would be found.

With our present knowledge of the figure of the earth, and the high degree of precision that has been attained in making comparisons of material measures, the quadrant is

not looked upon as a practical constant for re-determining a fundamental unit. All quadrants of the earth are not equal, for the earth is not a perfect figure of revolution.

Furthermore, a material unit, no matter on what constant in nature is bassed, or with what degree of percision it has been obtained, can only become a legal unit by statute. The statute alone gives finality, and not scientific determinations, to a measure as a standard.

To make this point clear, it may be said that the metric system would have lost none of its value had the French Academy of Sciences adopted as the unit of length an arbitrary unit as that of some properly constructed bar, which might for convenience have represented the toise or yard.

The merit of the metric system is, above all, its simplicity, and this is based on the two elements: (1) That all the weights and measures are inter-related and dependent upon one unit—the meter; and (2) That all the multiples and submultiples are tens.

The decimal system is the great saver from "the brain-wearying, intellect-destroying system of weights and measures in use among English-speaking people," as Lord Kelvin has so justly characterized the latter.

It is not believed that any one would for a moment question the desirability of adopting a system were we to begin *de novo* based on a single unit with derivatives by the powers of ten. The theoretical superiority of such a system is so manifest that it need not further be pursued.

However, for the purposes of life, we have to deal with the question from the practical and not from the theoretical stand point.

One of the most exhaustive reports on weights and measures, including the metric system, was written by the Secretary of State, John Quincy Adams, in 1821.

As we in Canada have not yet adopted the metric system, although it is a legal measure, the question presents itself—is it desirable, is it expedient, is it beneficial to replace the

present system by the metric system? In the wilderness or conglomerate of the former, we have, inches, feet, yards, rods, miles, leagues, gills, pints, quarts, gallons, pecks, bushels, grains, pennyweights, ounces (troy and avoirdupois), pounds, hundred-weights, tons (long and short), chaldrons—and the rest. The relationship which exists between the above is one toat has caused a vast amount of unnecessary expenditure of human energy in memorizing "tables." This expenditure is an absolute loss in our youth and is continued through life in our daily vocations.

By an Act of Congress of July 28, 1866, the metric system of weights and measures has been legalized throughout the United States, and it is the only system whose use is made legal throughout the whole country by Act of Congress. The Act, not being mandatory, has remained practically a dead letter.

At this moment there is a bill before Congress to make the metric system, after the 1st of January, 1903, the only one to be used by the various departments of the government, except in completing the survey of public lands.

In 1875, an international metric convention was agreed upon by seventeen countries, through which an international bureau of weights and measures was established. From this bureau, at Sèvres, near Paris, have been issued the prototype metric standards to the various countries, thereby assuring international uniformity in weights and measures.

In passing it may be remarked that Canada is sadly in need of a thoroughly equipped and scientifically maintained standardizing bureau for all the various fundamental units of measures.

From our commercial relations with the mother country and the United States, we are more or less guided by their action and their system of weights and measures. Conservative England, always slow to move in any matter of reform, is however beginning to awaken and by that most poweful lever, Commerce. Manufacturers and exporters are finding

to their cost that many avenues of trade are becoming contracted and even closed by the persistence of their present system of weights and measures when pitted in foreign countries against the universal metric system there. Boards of Trade, engineers and scientists have petitioned the British Government to adopt the metric system and have urged their claims with the most cogent reasons which cannot much longer be ignored. Many apparently insurmountable difficulties that have been portrayed by opponents to the desired reform, such as change of tools, plates and templets, in machine shops and factories have vanished by the fact that the changes have been made and to the commercial advantage of the manufacturer. That the change from one system to the other will cause some little exertion for a short time until the metric system is familarized, is admitted, but when once acquired people will wonder how they could possibly have floundered so long in the old morass of weights and measures.

The United States are in a position somewhat similar to that in Great Britain, perhaps somewhat worse, from the lack of a uniform system applied throughout the Union, for it appears every State is or may be a law unto itself in the matter of weights and measures, of which condition chaos alone can be the result. However, the metric system has made more advance in its use by the various departments at Washington than has been done in London, and a bill, already referred to, is now before Congress still further increasing its use, but unfortunately not with a compulsory clause applicable to the whole country. In order that the metric system may be speedily and thoroughly introduced, and with the least friction, it will be necessary in Great Britain and the United States as well as here to enact a law making the system, after a certain date, the only legal one and abolishing all the old measures. The scientists, the leaders of the manufacturing industries and the exporters are the advance guard clearing the way for the coming change, and the sooner the

change comes the better for the whole community. Sentiment for our old weights and measures must give way to a better system, one associated with a progressive people.

As our late Minister of Inland Revenue, Sir Henri Joly de Lotbinière, an ardent advocate of the metric system, pointed out, in his addresses on the subject, the change is sure to come in the very near future, so let us prepare for its reception by having our children thoroughly familiarized therewith in our public schools.

From circumstances it will fall to Canada to be the last among civilized nations to adopt the system and thereby close he circuit of the world, whereby there will be but one language in weights and measures.

May that day not be distant.

Modern Types of Danger Warnings on the Sea Coast.

By Lt.-Col. Wm. P. Anderson, M. Can. Soc., C.E.

[*Read 13th December, 1901.*]

Lighthouses. From the earliest dawn of commerce, which is coeval with the dawn of civilization, the necessity for danger warnings on the sea coast has been recognized. 300 years B. C. the pharos of Alexandria, the prototype of our modern lighthouse, was one of the seven wonders of the world, but this was crowned by the uncertain and rude light afforded by an open fire. The historic lighthouse of Corduan, at the mouth of the Garonne, built at the close of the sixteenth century, remains to-day, in point of architectural grandeur, the noblest edifice of its kind in the World. It, too, was first illumined by burning billets of oak in a chauffeur at the top. It was not until 1807 that the feeble light from a chandelier filled with 10 lbs. of tallow candles was supplanted in the famous Eddystone lighthouse by lamps, reinforced by paraboloidal reflectors, so that improved methods of lighthouse illumination began less than a hundred years ago.

Argand's accidental discovery that the superposition over an oil flame of a glass cylinder would, by increasing the draught, that is the supply of oxygen, vastly increase the brilliancy and steadiness of the light, was the first step in the improvement of illuminating apparatus.

The direction of a considerable proportion of the beams of light by placing the flame in the focus of a paraboloidal reflec-

tor was the next progressive step, but the crowning improvement in the illuminating apparatus of light houses was the utilization by Fresnel of there fractive power of glass, when cut into properly shaped lenses, to direct the light into parallel beams.

Since the days of Argand and Fresnel little has been done to improve the *theory* of lighthouse illumination. The principles adopted by them are still recognized as accurate, and progress has been in the direction of increasing the size and power of the apparatus, without departing from their general principles.

Spermaceti oil obtained from whales, seal oil and various fish oils, as illuminants, gave place to Colza oil, a vegetable product, and it, in turn, has been displaced by petroleum, a much cheaper illuminant, and capable of producing a much larger and more brilliant flame.

The English lighthouses burn petroleum in lamps having as many as ten concentric wicks, with an intensity of 2619 standard candles.

Of late years many experiments have been made with a view to replace oil by coal gas, acetylene gas and electric light, but petroleum is still generally used. It has the advantage over other forms of illuminants of being cheap and easily stored, and of giving a light with a clear yellow colour, which, it is claimed, penetrates fog better than the whiter lights obtained from more modern illuminants. In the endeavour to secure the best possible light producer many very powerful lamps have been invented, including a gas burner made by Mr. Wigham, of Dublin, containing 108 gas jets. He has superposed three such burners in the foci of separate lenses in a single lighthouse. The difficulty of using this apparatus consists in the great heat evolved, as well as in the immense lantern required to contain the superposed lenses, and to give sufficient air for and ventilation to the flames. Mr. Wigham has lately utilized the Auer light principle in his multiple jet gas burners, and must secure very great illum-

ination by this means. Mr. Emmerson of this city has shown me a lamp in which oil in a vapourized form is burned under an incandescent mantle. This promises a brilliant and cheap light, if mantles less fragile than those now in the market can be secured.

Acetylene also promises good results, when a perfect gas generator shall have been invented. Heretofore so much practical difficulty has arisen in producing pure gas, in producing it economically in the small quantities required in a lighthouse, and in preventing the mechanism from freezing, that acetylene has not yet supplanted oil in any of our lighthouses.

Electric light can only be profitably employed when the supply can be drawn from a commercial source. To instal and run an independent plant at a light station is so expensive, and is accompanied by so many practical difficulties, that even rich lighthouse boards, like those of England and France have extended the installation of electric lighthouses very slowly. In Canada we have a few lighthouses supplied by corporations producing electricity in large quantities. Advantage has been taken of the facility with which the electric current can be turned off and on, to make the light at Port Dalhousie occulting, by a simple clockwork; and to alternately light a lamp and operate a fog trumpet on a beacon in Victoria harbour.

So far as I can ascertain, Canada is the first country that has utilized an alternating current in an occulted light, and Mr. Trudeau of Ottawa is the inventor of the first electric fog alarm.

It has always been a question in my mind whether there was any great advantage in multiplying the initial intensity of light in the way in which the superposed burners and other large lamps do multiply it. In clear weather any ordinary good strong light is visible to the horizon of the lighthouse, and this is especially true of the clear atmosphere of Canada. In thick fog the most powerful light is entirely useless at a

distance of a few hundred yards, a distance so short that no vessel could get the warning of the light in time to be saved from disaster; consequently it is doubtful if the aim of the inventors of these extraordinarily powerful lights, to secure greater penetration in thick weather, is attained; on the other hand, a very brilliant light in clear weather is a distinct disadvantage, blinding the sailor, and preventing him from judging his distance either from the light or from neighbouring objects.

I believe that the immense sums spent in the maintenance of extraordinarily powerful lights would be utilized to better advantage in increasing the number and power of fog alarms in the same district.

Improvements in the illumination of lighthouses have been forced upon engineers by the growth in the size and speed of vessels. In the days of the old sailing ships, when shore lights were few and feeble, a powerful fixed light was a sufficient guide. In these days of 23-knot vessels, running through narrow, and often through dredged channels, when every city and small town is illuminated by electric light, the fixed light, that was so brilliant under old conditions, is rendered insignificant by comparison, and it becomes necessary to provide a beacon more powerful, and one that by its character can be recognized as soon as seen. The head lights of electrically lighted steamships are to-day as brilliant as many of the old fixed lights; this is another reason why it has been found necessary to adopt the principle of abolishing fixed lights altogether for the more important stations.

To the improvement in lamps I have already referred; the improvement in optical apparatus has been in the direction of varying the character of the light, either by occulting it, or by gathering rays into condensed beams by a suitable arrangement of lenses, thus giving a very powerful flash or groups of flashes followed by an eclipse. This flashing light can be very much diversified in character, but a description of the methods of attaining the results would be tedious if described technically.

The flashes are produced by revolving an arrangement of lenses around the lamp as a centre, and much ingenuity has been displayed in the details for carrying round the heavy machinery with the least possible friction. Today ball bearings are used on small apparatus, while the largest and most quickly revolving apparatus are floated in troughs of mercury. The most perfect development theoretically of this system of concentration of the rays is the French invention know as the *feu éclair*. This light is based on the laws that the time which a flash takes to make an impression varies inversely as its intensity, and that once having made an impression a certain time is necessary to allow a steady light to produce its full effect, and that this time also varies inversely as the intensity of the light. It has been demonstrated that a very powerfull beam will produce its full effect on the eye in the space of 1-10 second. Applied to lighthouses, this means that there is no advantage in making a flash of longer duration than 1-10 second, for this will allow it to be seen as a flash at the utmost distance at which it can possibly affect the eye, while as it is approached it will of course appear longer and stronger.

In the *feux éclairs* the lenses are so designed as to gather the whole of the light into one narrow beam, and are revolved so rapidly as to give flashes of about 1-10 second duration at intervals of 10 seconds. The resulting speed of the revolving beam of light is very great. Seventy miles is not an extreme limit of visibility for the most powerful lights, and at that radius the beam is travelling at the rate of about 440 miles in 10 seconds. Its width, therefore, to act on the eye, for 1-10 second, must be nearly 4½ miles. To give the necessary divergence to the beam, an extremely large size of flame is required; and in practice it is found impossible to maintain a flame large enough to give extreme results. The sailor, who usually cares nothing about theories, does not seem to take kindly to the *feu éclair*. He complains that it is impossible to locate a flash before it disappears, and he prefers a light of which he can take a bearing while it remains visible. There-

fore he favours less intense and longer flashes, but the general practice today is to greatly reduce the length of flashes and the dark intervals between them; and some of our old-fashioned revolving lights, having a period of two or three minutes, are hopelessly out of date.

Fog Signals. The increase in speed of ships, to which I have alluded, and in the quantity of shipping, as well as the haste insisted upon in these days of close competition, have made it imperative that ships should push on through fair weather and foul, through clear weather and thick, and all our prominent turning points are piled up with the wrecks of the vessels that have cut the corners too closely. In the endeavour to protect vessels under these conditions fog alarms have become more and more necessary, and more and more relied upon as aids to navigation, and are now found upon most salient headlands. These may be classified under four heads, viz:—

(1) Explosive signals.
(2) Sounds produced by reed instruments.
(3) Whistles, and
(4) Sirens.

The one advantage of explosive signals is the facility with which they can be established. The necessary electrical connections can be made in a few minutes, and their installation costs practically nothing, especially since gun cotton, exploded in the open air at the end of a mast, has taken the place of gunpowder fired from cannons.

A disadvantage of an explosive signal is that the noise is so short in duration that it may be drowned in a local noise, lost in the noise of the waves, or of a storm, or even in the roar of the gale in the rigging; moreover, it is difficult to fire with safety so frequently as modern requirements demand; if fired frequently explosive signals become much more expensive than more powerful and prolonged noises produced at frequent intervals by machinery. Canada is therefore aiming to replace explosive signals by steam or compressed air fog sirens.

The earlier trumpets and horns, operated by steam or air, were reed instruments, but these have been found less powerful than whistles and sirens, and are being rapidly replaced by the latter, although good horns have given surprising results. On one occasion I heard the horn on the Western Islands, in Georgian Bay, distinctly at Cape Croker, 26 miles distant, across a wind.

It is questionable if any sound can be produced superior to the clear blast of a good steam whistle, and many of our best fog alarms are large whistles. The sound can be varied by changing the intervals between the blasts and by the use of various modifications of whistle bells. Chime whistles are used, as well as whistles containing a piston, which changes the length of the bell and consequently varies the note. These variable whistles are known as "Modoc" or "Wild Cat" whistles. You will all remember the distinctive, if disagreeable, sound of the whistle that was on Eddy's factory, previous to the fire of 1900.

In the siren the sound is produced by forcing steam or air through small holes opened and closed very rapidly by the revolution on a perforated metal disk of another similarly perforated disk. By varying the number of openings or the speed of the revolution, the pitch or tone of the siren is changed. At Belle Isle I installed a 6-inch siren in 1899, giving alternately a high and a low note.

The air compressors here are driven by a jet wheel, with water led from lakes on the hills of the island, and the compressed air is piped for 4000 feet to the horns. This alarm is of the largest and most powerful type ever installed at any station, and is the only example of a fog alarm run by water power.

One disadvantage of all fog signals except steam whistles is that the trumpets throw the sound out in one direction, so that it is louder in the axis of the trumpet than in other directions. There seems, however, to be no way of over-

coming this difficulty. American inventors have taken advantage of this direction of the sound to equip a siren with megaphones directed to the cardinal points. Through each magaphone it sends a different signal, with the expectation that a vessel can judge the direction from which the sound comes by the relative loudness of the signals. We are now installing one of these Hamilton-Foster sirens at Fame point lighthouse, on the Gaspé coast, the first landfall made by vessels after crossing the Gulf inward bound, to experiment on this principle of judging sound direction. Even though the claim of the inventors, that the siren will indicate its own direction from the vessel, should be unfulfilled, the siginal will give an efficient coast warning, acting as an ordinary siren.

We meet with a good deal of difficulty and disappointment in operating our fog signals. This is because we cannot make mariners understand that sound signals are extremely liable to aerial disturbance. *Theoretically*, sound waves are propagated in straight lines in all directions from their source, exactly as light waves are propagated. *Practically*, these straight lines of sound waves are deflected by any little irregularity in the air through which they pass. If the air is not wholly homogeneous, the sound waves will not pass through it in straight lines, but will be deflected. and whether the deflection is down towards the surface of the water, or up into the air, the effect is the same; the sound does not travel parallel to the surface of the sea, and is lost to the sailor who is listening for it. A small island, a reef, or rocks, or even a shoal lying outside of a fog alarm station, will have the effect of unequally heating the air which covers them, and the air thus separated into strata of unequal densities, causes refraction of the waves of sound, and the fog alarm becomes ineffective. The same thing may happen, though it is not so likely to do so, where none of these natural obstructions are apparent. Times without number complaint has been made that one of our fog alarms was not in operation, when inves-

tigation proved that it was sounding as loudly as ever, the trouble being with atmospheric conditions. Some of you may have noticed echoes produced where there was apparently no hill or surface to reflect the sound. These echoes must have been reflected from strata of air differing greatly in density from that at the point of production of the sound, and are one example of the difficulties that fog alarm signals strive in vain to overcome. For these reasons we warn mariners that they must never judge their distance from a fog signal either by the power of the sound or by the absence of sound, because under certain conditions of atmosphere the sound may be heard loudly at long distances from the alarm; under other conditions it may be lost at a very short distance, and these conditions may vary at the same station within very short intervals of time or of space. Unfortunately it seems impossible to convince captains of this, and many wrecks have resulted from their ignorance of these well known aberrations.

Lightships. Danger signals that have been greatly improved in recent years are floating aids to navigation, including lightships and buoys. The modern lightship is a reservoir of complicated machinery, containing apparatus for revolving lights at the mast head; powerful fog signal machinery; auxilliary power for propelling the vessel, in case she breaks away from her moorings or is obliged to run for shelter, and mechanical appliances for relieving the strain on the anchor in heavy weather. A lightship, however, can in no way be considered as satisfactory an aid to navigation as a solidly founded lighthouse, because the motion of the waves prevents the light from being seen at a great distance, and in our climate a vessel must leave her station when ice forms, and is, therefore, unavailable at the time navigation is closing, when an aid is most urgently required; moreover she is liable at any time to break from her moorings, and may therefore not be fouud at the place expected. The one point in favour of a lightship is that her station may be so located that

vessels can run much closer to her than they can to a light on land.

Buoys. In 1899 there was an International convention on the subject of buoyage, which resulted in the adoption of rules to govern the shapes and colours of buoys. Canada has adopted these International regulations, and all our larger buoys have been made to conform in shape as well as in colour to these International regulations. To make the necessary improvements involved the furnishing of a large number of conical buoys.

The ingenuity that has been shown in the development of signal buoys is most interesting. The earliest signal buoy is the old bell buoy. I doubt if this has been much improved since the eighteenth century, when,

> The good old Abbot of Aberbrothok
> First placed a bell on the Inchcape rock,
> On a buoy in the storm it floated and swung,
> And over the waves its warning rung.
>
> When the rock was hid by the surges' swell,
> The mariners heard the warning bell ;
> And then they knew the perilous rock,
> And blest the Abott of Aberbrothok.

Tempora mutantur. Now the mariners curse a too paternal Government for not having replaced the bell buoy by a lightship or a pile lighthouse !

The bell buoy seems specially to appeal to the imagination of poets, perhaps because later types of signal buoys commend themselves rather to the utilitarian than to the sentimental side of our nature. Rudyard Kipling makes the bell buoy sing, with no lack of imaginative power indeed, and with the vigour that is his chief charm, but emphatically in the spirit of today :—

> They christened my brother of old,
> And a saintly name he bears ;
> They gave him his place to hold
> At the head of the belfry stairs,
> Where the minster-towers stand
> And the breeding kestrels cry.

Would I change with my brother a league inland?
("Shoal! 'Ware shoal!") Not I.

* * * *

At the careless end of night
I thrill to the nearing screw,
I turn to the nearing light,
And I call to the drowsy crew;
And the mud boils foul and blue
As the blind bow backs away.
Do they give me their thanks if she clears the banks?
("Shoal! 'Ware shoal!") Not they.

Through the blurr of the whirling snow,
Or the black of the inky sleet,
The lanterns gather and grow,
And I look for the homeward fleet.
Rattle of block and sheet—
Ready about! Stand by!
Shall I ask them a fee that they fetch the quay?
("Shoal! 'Ware shoal!") Not I.

I swoop and I surge and I swing,
In the rip of the racing tide;
By the gates of Doom I sing;
On the horns of death I ride.
A ship-length overside
Between the course and the sand,
Fretted and bound, I bide;
Peril whereof I cry.
Would I change with my brother a league inland?
("Shoal! 'Ware shoal!") Not I.

* * * *

The Courtenay whistling buoy is a most successful, ingenious and original invention. It is fitted with a long cylinder reaching down into the sea below wave action. As the buoy rises and falls on the water this cylinder acts as an air compressor, the compressed air being forced out through a large whistle on the superstructure, and emitting a fitful and distinctive moan. We have now in the Dominion over thirty of these buoys, and are rapidly adding to the number.

Another very successful and original buoy is the Pintsch gas lighted buoy, in which a specially purified gas is compressed to 10 or 12 atmospheres, and supplied to a group of burn-

ers through a reducing valve so gradually that a large buoy will burn night and day for three months without attention. An ingenious invention in connection with this buoy is an automatic cut-off that withdraws the supply of gas at short intervals, so as to give the effect of an occulting light. This result is secured by alternately filling and emptying a chamber capped with a piece of flexible leather, and owes its success to the extreme simplicity of the mechanism. With this attachment there are three burners, which are extinguished, grouped about a small pilot burner, not affected by the cut off, and which relights the outer jets as often as the gas resumes its flow.

Pintsch gas is largely used for lighting cars. The brilliant lights on the Canada Atlantic trains between here and Montreal are Pintsch gas-lights, the tanks on the cars being supplied from a gas works in Montreal. This gas is also utilized in many small beacon lights.

Many experiments have been tried in maintaining electrically lighted buoys, and a dredged channel entering New York harbour, Gedney channel, is equipped with electrically lighted buoys, but the system has not proved an unqualified success, as any damage to the cable extinguishes all the lights, and the cost of maintenance has been excessive.

A proposition has lately been made to safeguard the River St. Lawrence, between Montreal and Quebec, by a similar system of electrically lighted buoys. Any electrician will tell you how extremely expensive the installation would be, and how precarious the maintenance. The Department sent the proposer of the scheme out on our steam tender this winter, when we were saving our ordinary buoys from the running ice, and I expect, after what he saw there, we shall hear nothing more of that scheme.

We have had many interesting experiences with buoys that have gone adrift from our Atlantic shore. It is nothing unusual to hear of them anywhere out in the open Atlantic. One has come back to us from Ireland, and we have heard of

others in Spain and Africa. Our last prodigal was returned to us from Turks Island, in the West Indies, after being absent for about three years. This buoy must necessarily have made a long journey to have reached its destination. The only way in which it could possibly have reached the West Indies is by following the Gulf stream nearly to the coast of Ireland, down through the Bay of Biscay, past the Azores, the Cape Verde islands, and the African coast, and back to the coast of America through the equatorial ocean.

There are many other aids to navigation, such as hydrographic surveys, surveys of tides and currents, and the connection of lighthouses by telegraph with centres of commerce, which have been of great benefit to mariners, and of which an account might be interesting, but they can scarcely be classed as danger warnings, and are thus foreign to my subject. All the large naval powers are at the present moment experimenting with the Marconi system of aerial telegraphy, which the inventor claims will warn a vessel of the existence of danger more efficiently than any of the methods that are at present in use, but it remains to be seen whether the invention can be utilized in this way.

You may have noticed in the public press, during the year, many vigorous attacks on the lighthouse system of Canada. To read them one would think that all our lights and fog alarms were obsolete. If you make allowance for the immense extent of sea coast that we have to cover, for the youth of the country, and for the fact that all our aids to navigation are absolutely free to shipping, you will admit that Canada has accomplished a wonderful work, and one that should receive praise instead of censure, when I tell you that, since Confederation, the number of our lighthouses has been increased from 227 to nearly 900, and of steam fog alarms from 2 to 64. This large number of aids to navigation, besides thousands of buoys and other minor aids that have not been mentioned, are maintained at an annual expenditure of about half a million dollars.

It is true that many of our lights are not strictly modern, first-class lights, but all of them are good, serviceable lights under ordinary conditions of weather, and our fog alarms are as modern and powerful as any in existence.

We have the testimony of one Commander-in-chief of the North America station after another to the efficiency of our system, and many of the recent attacks on it have been inspired by a few shippers having selfish ends in view. If our lights are not perfect, we are improving them and adding to their number every year, and are also establishing new fog alarm stations, but even in their present condition they are ample to secure safety to a carefully and intelligently navigated ship. What we in Canada require more than improvements in aids to navigation, is education of the sailors and pilots frequenting our waters in modern methods of navigation.

The Impeccancy of the King.

A STUDY OF SOVEREIGNTY.

By Charles Morse, D.C.L.

[*Read March 21st, 1902.*

Lord Keeper Finch, one of the ablest of the many great Englishmen of the seventeenth century, said that "the sparks of all the sciences in the world are raked up in the ashes of the law." In view of such a declaration, no apology is needed for addressing an audience of laymen upon a subject wholly within the domain of Constitutional Law

But at the outset I am led to remark that one gets a very sad impression of the science of law in turning over the pages of general literature. Not only in the works of the professed satirists, from Horace to Dickens, do we find it impugned; but we meet with its studied disparagement in the most sedate plane of the literary sphere, in the poetical masterpieces of Shakespeare and Tennyson, in the philosophical essays of John Stuart Mill and Frederic Harrison (1). Do the flippant pleasantries of the 'Man in the Street' at the expense of the majesty of the law ever lack an appreciative ear; or does custom ever stale for us the old, old story of covetous lawyer and credulous client?

Let us pause for a moment to recall one or two *jeux d'esprit* of the sort designated, and see if they have lost their

(1) See *Order and Progress*, passim. I do not forget that Mr. Harrison is a barrister.

quondam charm for us. Macklin makes one of the characters in his *Love à la Mode* say: "The law is a sort of a hocus-pocus science, that smiles in yer face while it picks yer pocket." Listen to old George Stevenson's lampoon on the law: "Law is law—law is law; and as in such, and so forth, and hereby and aforesaid, provided always, nevertheless and notwithstanding. Law is like a country dance: people are led up and down in it till they are tired. Law is like a book of surgery: there are a great many desperate cases in it. It is also like physic: they that take the least of it are best off. Law is like a homely gentlewoman: very well to follow. Law is also like a scolding wife: very bad when it follows us. Law is like a new fashion: people are bewitched to get into it; it is also like bad weather: most people are glad when they get out of it." Here is a story illustrative of Peter the Great's contempt for the legal profession. Being at Westminster Hall in Term time, and seeing a great number of people swarming about the courts, he inquired: "Who are all these busy people?" "Lawyers," was the reply. "Lawyers!" cried the great monarch, "Why, I have but four in my whole kingdom, and I purpose to hang two of them as soon as I get home." Henry Fox, in the course of a philippic against Lord Chancellor Hardwicke, exclaimed: "Touch but a cobweb in Westminster Hall, and the old spider of the law is out upon you with all his vermin at his heels." Douglas Jerrold, too, is not without his fling at our unhappy science: "Self-defense," he remarks, "is the clearest of all laws; and for this reason—the lawyers didn't make it!" Even the sober and sedate Benjamin Franklin, who, as a statesman, ought really to have done better by us, cannot forbear to launch a satirical shaft at the hard-beset quarry. This is his characterization: "A country-man between two lawyers is like a fish between two cats." And, lastly in this connection, let us quote a piece of proverbial philosophy by Josh Billings: "Every man should know something of law. If he knows enough to keep out of it, he is a pretty good lawyer!"

Now what is the secret of this dislike of the law on the part of the hard-headed men of the world whose words we have just quoted? Surely not the belief that the law is an evil thing that it behooves society to purge itself of—for, in the present stage of human progress, law is at once the guardian and bulwark of society. No clear-headed thinker will deny that. "*Force*," says Joubert, "*Force till Right is ready!*" Law is civilized Force, and Right won't be ready until the millennium. Nor can it be that our critics espouse the view that the whole legal profession is an aggregation of knaves; that would be a reflection upon their good sense and judgment. Nor yet can we trace their attitude to the underlying motive of Jack Cade's minion when he cried: "The first thing we do, let's kill all the lawyers!" No, the secret of their hostility lies in that instinctive resistance to the restraints Positive Law, of necessity, imposes upon natural liberty, which you will find in the minds of the best of men if you probe them deeply enough. One of the satirical poets of America has said:

> No man e'er felt the halter draw
> With good opinion of the law;

but as a matter of fact this sentiment is not confined to the unhappy rogue who is called upon to suffer for his crimes. Is it not often the case that the same man who to-day lifts up his voice in Parliament in glowing eulogy of British political institutions will to-morrow, under the smart and perturbation which are his who has failed in some civil action at law, denounce the judges as venal, the lawyers as thieves, and the law itself as the very nidus of iniquity? To pay Customs duties with cheerfulness is surely an acquired moral taste; and to stay one's hand with a fishing-pole in it when the trout are jumping in a preserved stream, is not exactly a survival of the habits of primitive man.

And so we are brought face to face with the law every moment of our lives, and cannot escape the touch of its strong hand try as we will. It probes the very pith and marrow of society. "The progress and development of

law," says Lord Avebury (1), "is one of the most important sections of human history." And Paterson, in his fine work on the 'Liberty of the Subject' (2), observes that law is

> the greatest and most potent body of knowledge which concerns the children of men —a knowledge which reaches, directly or indirectly, all stations and classes, and challenges the attention of governors and governed alike, searching the roots of social life far and wide.

Then let us understand at this stage what 'the Law' is, for until we have a clear apprehension of the province of the science as a whole we cannot expect to examine intelligently that portion of it which is our present theme.

In the first place, let me say that many are the uses of the word 'Law.' There is hardly another term in our language around which centres such a confusion of ideas. A mere glance at one of the standard dictionaries will verify my statement. It is a far cry from the point where the word means the constant mode or order of operation which pervades the inanimate universe to that where it denotes a system of rules governing the players in a game of cards. Yet we commonly speak, without any sense of incongruity, of Kepler's laws of motion and Dalton's law of gases, on the one hand, and, on the other hand, of the laws of whist. Strange to say, no class of thinkers have done so much to promote this ambiguity of meaning as the lawyers themselves. They seem almost wilful in their neglect to limit it to the government of rational and volitional beings. Blackstone, in his well known declaration of the unity of law (3), merely affirms for the English school what Montesquieu (4) had already said for the Continental jurists. Both adopted the theory, everywhere current up to the great renascence of legal study in the nineteenth century, which predicated all the phenomena of order and harmony, both in the physical and political world, as the

(1) Lubbock's Orig. of Civ p. 300.
(2) Vol. I. p 7.
(3) Comm. I. Introd. 66.
(4) Esprit des Lois I., c.i., p.i.

results of obedience to the fundamental law of the Creator. Although we find this doctrine expounded by such theologians as St. Thomas Aquinas (1) in the thirteenth century, and Hooker (2) in the sixteenth, we have to go back to pagan philosophy, to Chrysippus (3), the Stoic, and Cicero (4) to find not indeed its origin, for that extends itself into a more remote antiquity, but perhaps the earliest definite statement of it. Still it must be confessed that we of the English tongue are in worse case in respect of this confusion of ideas than either the citizens of Imperial Rome or those of modern European States For in the Latin we have two words signifying 'Law': *jus* being the generic term for the whole body of legal rules and relations, and *lex* denoting only so many of them as inhere in legislative enactment. So in French we have *droit* and *loi*, and in German *recht* and *gesetz*, expressing the same distinction in meaning as the two Latin words above quoted. On the other hand the single word 'law' in English not only embraces the two great sub-divisions of jural science, namely, custom and legislation, but has also to do duty in physical science as denoting the method of natural phenomena. Indeed, so various are the uses of our word 'Law' in the theoretical and practical sciences that it would require more space than I have allotted to my whole subject to discuss them with measurable completeness. Let me then conclude my brief excursion into the seductive domain of philology, by declaring that the law I treat of here is what Sir William Markby has so happily phrased as "the Law of the Lawyer."

Now the 'law of the lawyer,' or, to use the more pretentious locution of the schools, Positive Law or Jural Law, I would venture to define as: *The aggregate of the various limitations which the sovereign power in a State imposes up-*

(1) I. 2 Qu. 93, Art. 2.
(2) Eccl. Pol. I. c. 18.
(3) Apud D. Laert. vii., 88
(4) De Leg. II. 4.

on the natural liberty of its individual members in order to secure the well-being of society. Of course I am well aware that such a definition will savour of heresy to the disciple of Sir William Blackstone. But to the latter-day student my refusal to laboriously flog the dead horse of Blackstone's definition of Positive Law (or as he styles it: 'Municipal Law') cannot fail to commend itself. So far as the great eighteenth-century commentator is concerned it is not necessary for me to say more than that if we accept his declaration that the totality of Positive Law is: "A rule of civil conduct, prescribed by the supreme power in a State, commanding what is right and prohibiting what is wrong (1)," then we must assume that in the law we shall find a criterion of proper behaviour in all the situations and conditions of social or civil life; and, moreover, that we need not concern ourselves about any well-doing that is not commanded by the law, nor fear that we may do wrong if any contemplated act be not forbidden by it. To understand the fallacy of this assumption we have only to reflect that the law commands but a very small proportion of the acts that constitute one's conduct in the multifarious concerns of civil life, and that its prohibitions are correspondingly few. As Professor Sheldon Amos so pithily says: (2)

> A man may be a bad husband, a bad father, a bad guardian, without coming into contact with the rules of a single law. He may be an extortionate landlord, a wasteful tenant, a hard dealer, an unreliable tradesman, and yet the legal machinery of the country may be quite powerless to stimulate or chastise him. He may be, furthermore, a self-seeking politician, an unscrupulous demagogue, or an indolent aristocrat, and yet satisfy to the utmost the claims of the law upon him. Nevertheless it is just in the conduct of these several relationships that the bulk of human life consists, and national prosperity and honour depends.

And all this seems to imply that the attitude of the law toward men in society may be summed up in the declaration: "So long as you do not infringe my prohibitions, be as wicked as you please!" But this is only true in a qualified sense. It is true the law does not seek to enforce abstract morality;

(1) Comm. Bk. I., Introd. 45

(2) Science of Law, p. 30

but, on the other hand, it frequently coincides with what theologians call 'external morality'. For instance, the eighth commandment of the Decalogue is a rule of outward conduct; and so is the prohibition of theft in the Criminal Code of Canada. Yet the law does not punish stealing because it is an offence against God, but because it is an injury to the security and well-being of the State, the conservation of the latter being the sole object of positive law. Again, positive law often makes actions which are morally right, legally wrong. So far as abstract conceptions of right are concerned, a man is at liberty to build his house of any material or in any manner he pleases; but municipal by-laws prevent him from building it of wood within the limits of a prescribed fire-area. "May I not drink whiskey made in Scotland?" says the thirsty toper in Canada. "Not until you have paid us duty thereon," answers the Customs and Tariff Acts. "May I not marry whom I choose?" cries the disciple of Rousseau. "You are not free to marry a ward-in-chancery without the consent of the court," replies the law of the Little Englander. And so *ad infinitum*. Aristotle (1) thought that civil society was founded that its members might live righteously, for, he says, "the first care of the legislator must be that the citizens should be virtuous, otherwise civil society would be merely an alliance for self-defence". This conception modern lawyers unhesitatingly repudiate, preferring to assent to the proposition of the Chinese Code (2), viz: "that the chief ends proposed by the institution of punishments in the empire have been to guard against violence and injury, to repress inordinate desires, and to secure the peace and tranquility of an honest and unoffending community."

Men cannot be legislated into righteousness; but, as Ashurst, J. said over two hundred years ago (3) "it is in the power of the law to take from evil-minded men the ability of

(1) Pol. Bk. III., c. 11.
(2) Staunton's Code of China, lxvi.
(3) 22 St. Tr. 231.

doing mischief, and to restrain them of that liberty which they so grossly abuse." Law constrains a man's outward acts as a member of society; it does not presume to exercise a moral censorship over him It estimates his conduct solely in conformity to an external standard. The absurdity of attempting to implant the seeds of virtue by physical sanctions is well exemplified by the story told of a famous head-master of one of the great English public schools: "Boys," he exclaimed at the conclusion of an admonitory harangue, "Boys, if you are not pure in heart, I'll flog you!"

And so we learn, then, that the domain of the law is not coterminous with that of morality, although there are occasional points of intersection between them. But when we enter upon the study of jurisprudence, we must not only disassociate law from morality; we must, furthermore, apprehend the fallacy of the vulgar error that law is not entitled to respect unless it squares in extent and harmonizes in spirit with natural justice. The demand of our friend the 'Man in the Street' that "law shall be justice," never fails to excite the risibilities of the law-maker. He is prompted to answer: "Discover to me your eternal principles of justice, and I shall crystallize them into statutes. I do not find them categorically stated in the Scriptures of revelation; and the Greek poets tell me that Astraea left the earth with the passing of the Golden Age. Failing then to find a code of natural justice sufficient to meet every exigency of civil life, I must create artificial canons of right which will not be perfect because they are of human origin, but which will be the best possible rules of outward conduct to be observed by men as members of society." We would, therefore, bid our thoughtless critic of the law not only to go to the Greek and Roman philosophers but to the classic poets as well, if he would understand the distinction between natural and positive justice. Homer employs the term *themistes* (1) to denote celestial decrees directly communicated to mundane tribunals for their

(1) In the *Odyssey*, xvi, 403, for example.

guidance. In Sophocles we find Antigone appealing from the edict of King Kreon to the

—agrapta k' asphale Theon
Nomima

("the unwritten and stable laws of the gods"); and Horace emphasizes the distinction in this wise:

Vir bonus est quis?
Qui consulta patrum, qui leges juraque
Servat

—"Who is a good man? He who observes the decrees of the fathers, and human laws as well as the laws of nature."

Before leaving the question of the relations of Positive Law to Morality and Natural Justice, I desire to pay a tribute to the great service done by modern English philosophical jurists in differentiating legal and ethical science. In no other school has this been done so thoroughly and so well. Referring more particularly to the Germans, and remembering the great precision of thought which generally characterizes them, one marvels at the failure of their philosophers who touch upon the subject to distinguish the provinces of Law and Ethic (1). In commenting on this fact Professor Sheldon Amos says (2):

> The result of this philosophic tendency in Germany has been to merge the scientific treatment of law in the larger region of general ethical inquiry; and consequently, instead of the science of law making an even and independent progress of its own, it has undulated with every wave of ethical speculation, and has consequently suffered the retardation incident to the growth of the most involved, because the most composite, branch of intellectual research.

Indeed it would seem to be as hard for a speculative jurist to avoid divagation in German as Heine found it hard to be witty in that tongue. Leroy-Beaulieu's felicitous phrase (3) 'cloudy jurisconsults' is the best characterization of these writers.

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(1) With the possible exception of Kant. Cf. his *Tugendlehre*, Werke, vii, p. 177; *Rechtslehre*, Ibid. p. 27.

(2) Sc. of Law, p. 2.

(3) The Modern State, ch. II. p. 25.

Now we would have the support of so distinguished an authority as Sir William Markby (1) if we should claim the honour of founding the science of law for John Austin, an Englishman, whose fine work, entitled the *Province of Jurisprudence Determined*, forever removed the reproach erstwhile so frquently flung at the English people by continental writers, namely, that while they were the most law-abiding people in the world they were as ignorant of, and as indifferent to, the philosophy of law as the Hottentots. Thanks mainly to Austin we have the pleasurable assurance that to-day no man of any race may consider himself to have a proficient knowledge of Jurisprudence unless he is familiar with the contributions of Englishmen to the literature of the science.

Let me now, in the interests of clear understanding, restate my definition of Positive Law before we proceed to examine that branch of it which has to do with the legal perfection of the King of Great Britain and the Dominions beyond Seas, the theme proper of my present observations :— *Positive Law is the aggregate of the the various limitations which the sovereign power in a State imposes upon the natural liberty of its individual members in order to secure the well-being of Society.*

And yet I fear I must pray His Impeccable Majesty to wait in the ante-room of your attention until I make clear to you (1st) what a 'State' is ; and (2ndly) what is generally meant by the 'sovereign power' in a State.

"He who would enquire into the nature and various kinds of government," says one of the great publicists of the past (2), "must first of all determine 'What is a State?'"

When Louis, *le Grand Monarque*, in the middle of the seventeenth century, delivered himself of the famous *mot*, *L'état c'est moi*, he was only wrong in that he failed to discriminate between the political unit, the State, and

(1) Elem. of Law, 2nd Ed. Sec. 12, p. 4.

(2) Aristotle: Pol., III., i.

the political entity which was then its ruler in France, namely, a despotic King. In short, he confounded absolute sovereignty and delegated sovereignty. And this lack of political insight was characteristic not only of French kings but also of the French people down to a comparatively recent period in history. In 1852 when the people were asked if they would be governed by Louis Napoleon, or by an Assembly, they answered: "We will be governed by the one man we can imagine, not by the many people we cannot imagine!" (1). Thanks to the Puritan politicial philosophers the English were earlier and better taught the difference between positive and representative sovereignty; although we have to confess that so late as the time of Blackstone we find apologists for the divine right of kings among English jurists. However, by that time so diluted with mere sentiment has the argument for the theory become that its toxic properties require no antidotes to be administered by the doctors of the law. But this is mere digression.

Karl von Savigny, the celebrated German jurist, truly says that a People is a natural unit as contrasted with a State which is an artificial unit (2); but when he proceeds to declare that the natural unit never exists in history without its bodily form the State, he forgets the distinction drawn in this behalf by Aristotle (3) who instances the Arcadians as constituting an *ethnos* until they founded a City, and so became a *polis*, a community in the law (4). So far from a given People and the State being co-extensive we know that some European States —Austria and Russia for instance—embrace several Peoples, the former including Germanic, Slavic, and Magyar races, and

(1) See Bagehot: *Eng. Con.* p. 34.

(2) Savigny: System, i. p. 22.

(3) *Pol.* ii, 2, 3.

(4) Strange to say the conception of a State in the mind of the average statesman of ancient Hellas never got beyond the limitations of a City. Plato, however, declares in the *Republic* that the State may grow to the extent of its possibilities for unity.

the latter Slavic, Finnish and Tartar peoples. Again the Jews are a nation at large. "Nothing," says Leroy-Beaulieu (1),

can be more false than this conception. The whole of history contradicts it, and the present even more than the past We must not confuse the free regions of the surrounding social medium, the Society, with its spontaneous movement, ever creating new combinations with an inexhaustible fertility; we must not, I say, confuse this with that apparatus of force and coercion which is called the State

And yet it is not easy to define the actual, concrete State as distinguished from a Nation or a People. Possibly I would satisfy the critical instinct of the political scientist if I were to declare that the State is simply the embodiment of governmental powers. But I will not make myself clear to the average lay mind unless I formulate the criteria, or rather the phenomena, of the State.

In the first place, then, it, will be seen that the State manifests itself as the organization of a People for the establishment of Government,—if the organization be not for this great political end then it will have no greater status in International law than a combination of men for commercial purposes, such as a joint-stock company, or for religious purposes, such as an incorporated church. Secondly, it will be seen that a State always exists within definite geographical boundaries. Thirdly, it is to be noted that it must possess an organ of Government capable of making and enforcing law within the community—for, as Austin (2) puts it, "in order that a given Society may form a Society political, the generality or bulk of its members must habitually obey a superior determinate as well as common." And fourthly and last, it will be observed that a 'simple' State—by this the publicists mean an *independent* State—must not only be supreme within its own borders but must also not be subject to any extra-territorial control. Let me add, by the way, that in this last category there inheres a very adequate test of the essential difference between a People and a State, above alluded to. The People resident within certain geograpical boundaries of the civilized

(1) The *Modern State*, c. iv., p. 50

(2) Prov. Juris. Det. I Lect. VI p 224.

world are not free to do so as they will because they are subject to the governmental control of the State; while on the other hand the State is absolutely free and omnipotent, in a mundane sense, within the limits of its jurisdiction.

Having thus explained to you the nature of a State, you may very reasonably expect me to give you some idea of its origin in the records of sociology. In answer to such an assumed expectation on your part let me merely remind you that theories concerning the beginnings of Society, theories contractual, theories intuitional, and theories evolutional, have been exploited ever since the days of Plato, who declared (1), what all modern sociological research attests, namely, that political government originated in parental authority, the family being the primordial social unit; and to offer, as an apology for my abstention from troubling you with any hypothesis of my own, the observation that as history demonstrates that no Society ever existed without the rudiments, if no more, of laws and of government, the lawyer, whose business is with the latter, may profitably leave all speculation as to the origin of the former to the lively genius of the philosopher.

Just let me illustrate, in passing, the difference between an independent or 'simple' State, and that body-politic which although called a State is subject to an extra-territorial sovereignty And I shall use our neighbors to the South as affording sufficient illustrations of both types. The federal republic known as the United States of America is a member of the family of nations because it possesses sovereign power, and is free from control outside of its territorial jurisdiction. The Commonwealth of Massachusetts has no recognition in public International law because it has surrendered to the federal State the prerogatives which constituted its complete independence within the family of nations—such as the treaty-making power, the right to raise and equip an army and navy, the right to declare war.

(1) Laws, IV, 209.

At the time of the outbreak of the American Revolution the United States, though confederated, did not constitute a State because the central Government had no direct relations with the people, no power to enforce its decrees, and was therefore dependent upon the assistance of the several State governments to carry out its policy. But by the constitutional change of 1789 the character of a true State was impressed upon the Union, which it has ever since maintained.

The Dominion of Canada has a constitution more favourable to national solidarity than that of the United States of America, seeing that all the unnamed sovereign powers are vested in the federal authority—the very converse of the provisions of the American constitution in regard to undefined political powers; but of course Canada is not an independent State. Yet, with such a constitution, she is splendidly equipped for becoming an integral part of the mighty pan-Britannic State that is to be.

I am sure the practical lawyer, who is above all things opposed to decking out the plain facts of legal science with bizarre costumes from the wardrobe of pure theoretics, will approve my resolve not to leave this part of my subject without recording my opinion of the futility, to say the least, of the attempts of such thinkers as Herbert Spencer, in England, Von Stein and Schäffle in Germany, and Proudhon in France, to treat society as an actual, living organism. According to the ingenious Schäffle (1) there is a very close analogy, both physiologically and psychologically, between society and the human individual. Other German writers have made the comparison still more intimate, and have likened the function of the State in relation to Society to that of the brain in the human body To appreciate the absurdity of the more general parallel, namely, that between the human being and the State, is to remember that, granting the latter could be treated as a true organism—a biological hypothesis which I stoutly deny—Man is more than an organism. He,

(1) See his *Bau und Leben des Socialen Korpers*, passim.

if Sir William Hamilton is right, is an Intelligence served by organs. And as to the State constituting the brain of Society one has to say that so far from the State doing any thinking for Society, it is the concrete Government (*gubernaculum*, a rudder, the ruling power), that, by delegation, does the thinking for the State.

Concerning this ingenious hypothesis, Professor Maitland, of Cambridge, says (1)

A Sociology, emulous of the physical sciences, discourses of organs and organism and social tissue," unable "to sever by sharp lines the natural history of the States group [of existences] from the natural history of other groups.

It is now only necessary for me to explain in a general way what I mean by the Sovereign Power in a State before I enter upon a discussion of the relation of the King to that power, which I trust has not been deferred beyond the demands of perspicuity.

Sovereign power, or sovereignty, as a term in political science, may be defined, shortly, to be *the ultimate coercive power in a State*. In jural science it is recognized as the foundation upon which rest all the sanctions of Positive Law. It is neither reposed in nor synergetic with the organ of Government, which makes and administers the law, but is behind it. Sovereignty in the abstract resides in the whole body of the people of a State. (2). And that is only another way of putting the famous apothegm of the American Declaration of Independence that: *all Governments derive their just powers from the consent of the governed* (3.) To deny this proposition is to say that the body-politic is a dead thing upon which the vultures of tyranny and usurpation have a prescriptive right to feed.

With this estimate of sovereignty in our minds you can readily apprehend that the sovereign power and the King

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1) Introd. to GIERKE' *Pol. Theories of Middle Age, xi.*

(2) Merlin (Rep. 31, 360) says: "La Souveraineté est la source de toutes des'ois."

(3) "Force is always on the side of the governed; the governors have nothing to support them but opinion" Hume: 'Essays,' (1875 ed.) i, pp. 109, 110.

are not convertible terms in the constitutional polity of Great Britain and her colonies; nor will you be disposed to scent sedition and disloyalty in my words when I declare that the maxim *Rex non potest peccare* is no sufficient support for the view that His Most Excellent Majesty King Edward the Seventh is impeccable in the eye of the law by reason of "the divinity" that "doth hedge a King," or that he is above the law. And you will be justified in acquiescing in my declaration, notwithstanding the *jure divino* apologists of the seventeenth century (1) and Sir William Blackstone, the eighteenth century apostle of constitutional confusion.

If you look upon this utterance of mine as presumptuous read the Introduction to Professor Dicey's *Law of the Constitution*, where, after quoting Blackstone's famous apotheosis of the King, he curtly says: "It has but one fault; the statements it contains are the direct opposite of the truth." However, we are not obliged to resort to an exponent of the the New Law Learning in order to dissipate this mist of constitutional fallacy; we can find the truth of the matter adequately set forth in the pages of an eighteenth century churchman, namely, by Paley in his *Moral Philosophy*, especially in Book VI, chapter vii. He tells us there that while theorists have ascribed to the King absolute power and impunity, yet when one turns to the actual exercise of royal authority in England, we see those formidable prerogatives dwindle into mere ceremonies. But I fancy I hear you object: "There must be something more than theory in the question of the impeccany of the King, because it is daily brought home to our business and bosoms. For instance, one can hardly listen to an argument in the Canadian Exchequer Court without hearing the maxim applied in derogation of the doctrine of universal amenability to the law." And I answer your objection in this wise: The maxim manifests its principal activity to-day in actions at law, being chiefly relied on in Crown suits of a civil nature to excuse the Executive from

(1) *e.g.* Sir Robert Filmer, *(Patriarcha)* and Sir Geo. McKenzie *(Jus Regium)*.

responsibility for the negligence of Departmental officers and servants. But, in order to understand how it came to discharge this function we must take an extensive survey of political history.

The Norman Conquest imposed on England the feudal system in all the vigor which it had obtained in France at that period. By that system, the fabric of which was built from foundation to turret of usurpation and force, the King assumed not only the paramount ownership of all the land within his dominions but also the political overlordship, which recognized no superior. This, of course, was radically different constitutional doctrine from that which the Anglo-Saxons had evolved before the Conquest. In the days of the Heptarchy the supreme sovereignty of the people of the several kingdoms was demonstrated in the fact that the Witenagemot not only claimed but actually practiced the rights to make laws, impose taxes, negotiate treaties, and, *mirabile dictu*, even to elect and depose the King himself (1).

Now the Witenagemot was not only the germ of the present British Parliament, but we find in it all the constituent parts of that august body. The King was generally present in person, and at his summons came the prelates, the abbots, the earldormen and the thegns—foreshadowing the House of Lords; on the other hand, the democratic element of Parliament potentially inhered in this ancient assembly by reason of every freeman in the land theoretically having the right to attend. We all can recall how our youthful imaginations were fired by the picture drawn in our school books of the crowd of freemen present at the deliberations of the Witan, signifying their approval of, or dissent from, its decisions by loud shoutings or the clash of arms. Professor Freeman says (2):

> Down at least to the Norman Conquest, the body which claimed to speak in the name of the nation was, at all events in legal theory, the nation itself . . . . There

(1) Cf. Green's *Conquest of England*, i. p. 11; Kemble's *Saxons*, ii. 219.
(2) *Growth of Const.* cap. I.

was a time when every freeman of England could raise his voice or clash his weapon in the assembly which chose bishops and earldormen and Kings; when he could boast that the laws which he obeyed were laws of his own making, and that the men who bore rule over him were rulers of his own choosing.

And Kemble (1) declares that:

Whether the assembly of the Witan making laws is considered to represent in our modern form an assembly of the whole people, it is clear that the power of self-government is recognized in the latter.

We have well authenticated instances of the deposition of Kings by the Witenagemot, numbering amongst them Ethelwald and Alcred, in Northumbria, and Sigebert, Ethelred II and Harthacnut in Wessex (2). As to the people's right of electing the King, I shall speak a little later on.

However, under the absolutism of the Normans we cannot expect to hear much of the theory, still less of the practice of popular sovereignty as conceived in the polity of the Anglo-Saxons. The popular assembly of the former gave way to the *Curia Regis*, in its early stages at least a mere court of the King's feudal vassals, who, as might be expected, pandered to his despotism; and thus was the progress of the liberty of the subject retarded for nearly two hundred years. It was not until the effectual blending of the Franco-Norman with the Anglo-Saxon stock that the blossom of Magna Charta appeared on the tree of British freedom, a magnificent promise of the full fruitage of popular government with which the Empire fearlessly confronts the issues of the new century.

The late Dr. Rudolph Gneist (3), next to Bishop Stubbs the most acute explorer of the Constitutional history of England, says:

The Norman government of the Kingdom rested upon a combination of the relations of the military, judicial, police, financial and ecclesiastical authority, consequently its central point was found in the person of the King.

Thus with the advent of the Conqueror, as Professor Edmund Robertson, in his monograph on 'Government' in the *Encyclopædia Britannica*, so well puts it, "Every ancient

(1) Saxons, ii, 239, 240.

(2) Cf. Taswell-Langmead's *Eng Cons. His.* cap I.

(3) Const His. Eng. I, cap. 16.

common right has come to be a right of the Crown, or a right held of the Crown by a vassal."

From this usurpation of the ultimate sovereignty of the State by the Conqueror and his immediate successors arose the doctrine of the legal sinlessness of the King and his immunity from the obligations of law, which Blackstone has so erroneously declared to be "an ancient and fundamental maxim." After examining with much care the sources of history which have been revealed since the time when Blackstone wrote, I am persuaded that the doctrine, contrary as it is to the most archaic theory of English Constitutional law, had its origin in procedure rather than in substantive law; in fact manifesting itself first in the anomaly which the old pleaders professed to see in the King commanding himself, by process issued in his own name, to appear and submit to judgment pronounced by himself in one of his own Courts. That, however, was an idea not evolved until over two hundred years after the Conquest, as will be shown hereafter; but when it did appear it was eagerly seized upon by ecclesiastical advocates of the celestial authority of Kingship, conjointly with certain sycophantic jurists of the times of Tudor and Stuart absolutism, and by them palmed off as being of the very pith and marrow of the British Constitution.

Had the immunity of the King from actions at law been always recognized in history, the advocates of the doctrine of his inherent supremacy over the law would have had much more countenance. But unfortunately for them the record is the other way. The very phraseology of the Coronation oath which King Edward VII. is expected shortly to take, amid surroundings of unprecedented pomp and circumstance, bespeaks potential naughtiness on his part, for it requires him to swear to govern not *his* people, mark you, but "the people of the United Kingdom of Great Britain and Ireland and the Dominions thereunto belonging, according to the statutes in Parliament *agreed on*, and the respective laws and customs of the same." But I have something much more conclusive of

the question than this for your consideration.

In the report of a case determined in the year 1351 (the twenty-fourth of the reign of King Edward III) (1) Wilby, C. J. of the Common Pleas, declared he had seen a writ thus framed: *Praecipe Henrico Regi Angliae* &c., — "in lieu whereof," he says, "is now given petition by the prerogative." Wilby's statement has been severely criticized by Brooke, C. J. in his *Abridgement*, tit. 'Petition' 12 and tit. 'Prerog.' 2(d), and by Erle, C. J. in the comparatively recent case of Tobin v. The Queen (2). But such criticism entirely overlooks other ancient authorities quoted by Mr. Horwood, the translator and editor of certain of the Year Books, who says (3):

> The ordinance of the Council and of the twelve chosen by the Commons made in the year 1258, and confirmed by Henry III. in the following year, seems plainly to give the subject the right to sue by writ against the King; (See Rymer's "*Foedera*," i 381, ed. 1816) and it may have been one of the writs issued after this provision that Wilby saw.

Bishop Stubbs (4) thinks that Chief Justice Wilby's statement has much corroboration in the older reports of cases; and Mr. Alfred Cutbill, in a valuable essay on *Petition of Right* (5) seemingly adopts the authorities cited by Mr. Horwood as substantiating that up to the time of Edward I. the subject's right to sue the King by writ was undoubted, but that in this reign petition of right was declared to be the only remedy against him, not by an Act of Parliament, but by a mere ordinance of the King himself.

As this 'mere ordinance of the King' harmonized with the theory of the attorneys of that day that the King ought not to command himself, my own view of the matter is that they were able, by appealing to the material interests of their clients, to stifle the protesting voice of popular rights. "Humor the King in his royal whim," one might fancy them

(1) Y. B. 24 Edw. III. 55 b.
(2) 16 C. B. N. S. 356.
(3) Y. B. 33 and 35 Edw. I, Introd. XVI.
(4) Const. Hist. Eng. ii., p. 250.
(5) Pp 8 and 9.

saying, "and your claim will be allowed. Take a writ against him, and you may lose it in litigation." Certain it is, that the remedy by petition shortly after became the only method used for obtaining redress for the peccancies of the impeccable King; but it must be remembered that there is no enactment of the English Parliament depriving the subject of anv remedy he may have anciently exercised The Act 23 & 24 Vict. does not not do so, it being limited to amending the procedure on petitions of right (1).

Before leaving this subject, I must not omit to mention the important fact that in Prynne's *Plea for the Lords* (2) the Patent Rolls of 43 Hen. III. are cited as giving power to every man injured "freely to sue against, or arrest the King."

After all said and done there is practically little difference between the modern Petition of Right and a Writ of Summons so far as getting the King into court is concerned, for the constitutional rule is that the Executive should never capriciously withhold a fiat for a petition to be filed in the courts. (3). So it would appear that the history of this matter of procedure unfolds but a weak foundation for the theory of the legal sinlessness of the King.

On the other hand, when we turn to the repositories of the law of the Constitution we find that they are almost unanimous in maintaining that the King is subject to the law of the land. Furthermore, English Constitutional history repeatedly shows that the people have not scrupled on great occasions to assert their sovereignty over the person of the King. I have already given instances where the Witenagemot deposed him, and shall supplement them with instances where the people exercised the same and also cognate powers later on in history. Suffice to say here that both constitutional theory and practice show very conclusively that the

(1) See Clode on *Pet. of Right*, p. 157.

(2) P. 97.

(3) Clode on *Pet. of Right*. 166,

paramount sovereignty of the people is, and has ever been, the true genius of English political institutions.

Taking up the threads of Constitutional theory, we find that even before the Revolution of 1688 they might have been woven into a web of argument through which the most subtle advocate for absolutism could not break.

"The further back we carry our researches", says Allen in his masterly *Inquiry into the Rise and Growth of the Royal Prerogative in England.* (1)

The stronger is the evidence we discover that, however the monarchical theory may have been proclaimed in law-books and magnified by Churchmen, it was never reduced, strictly and completely, to practice; nor was it ever recognized or quietly submitted to by the people as the Government handed down to them by their ancestors.

Now we have it on the authority of Tacitus (2) that the primitive political constitutions of the Germans, the ancestors of the Anglo-Saxons, were essentially democratic, hence the assertion of ultimate sovereignty by the Witenagemot, as I have before pointed out. Says Professor Freeman (3):

In the Germany of Tacitus, as at this day in the democratic Cantons, the sovereign power is vested in the whole people, acting directly in their own persons.

I have already shown how the people in the time of the Heptarchy did not lack the courage to assert their sovereign right to depose Kings who failed to rule in conformity with the law. The correlative right of electing the King was also claimed and exercised by the Witenagemot. Undoubtedly there was a royal family in each of the several Kingdoms of the Heptarchy, but they had no vested right to the throne. The Crown was then an office, and not a piece of inheritable property as it afterwards became. Among the members of this particular family the Witenagemot had the right of free choice, and usually they confined their selection to it. Thus Ethelred I, in 866, was chosen in preference to the issue of his elder brother. In 946 Edwy son of Edmund, was at first ignored and his uncle Edred elected to the throne; but, on the latter's death, Edwy became King by the choice of

(1) P. 10.
(2) *De Mor. Germaniae*, cap. 7-13.
(3) *Growth of Eng. Const.* cap. i.

the people. Ethelred II after having been deposed in 1013, was restored the following year. In 1066, however, the royal family was overlooked altogether and Earl Harold, the greatest Saxon statesman after Alfred, was elected King (1).

And so history establishes beyond cavil that the Saxon Kings were subject to the sovereignty of the people.

Now when we come to the Conquest there is one important fact, apt, indeed, to be obscured by the despotic character of his conduct as soon as he felt himself securely on the throne, namely, that William of Normandy, at his own request, was formally elected King by the Witan; and, moreover, as I have pointed out before, swore by the ancient Coronation Oath to govern the Kingdom in conformity with the laws then existing. It seems to me that this fact throws a great deal of illumination over the post-Conquest deposition of Kings by the English people, as well as over the last instance of the assertion of their ancient sovereign right to elect a King, namely, in 1689.

The first King to be deposed after the Conquest was Edward II. He was formally deposed by the Parliament which assembled at Westminster, in January 1327, because, in the opinion of Parliament, he had broken the Coronation Oath, "had ruined his Kingdom and people, and had suffered himself to be led in all things by evil councillors." Clearly, then, Edward II was not impeccable. Possibly the mind of Parliament at that time was supported by what Bracton, whose book on the Laws of England is called "the crown and flower of English medieval jurisprudence", (2) wrote nearly a century before: "The King has as superiors (*a*) God, (*b*) the law, and (*c*) his court; for the earls are the King's *comes*, and he who has a *comes* has a master". (3)

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(1) Cf. Allen's *Royal Prerog.* p. 44; Taswell-Langmead's *Eng. Con. Hist.* cap. 1.

(2) Pollock & Maitland's *Hist. Eng. Law* i, 185.

(3) See *De Leg. Ang. f 34 b.* It is claimed that Bracton did not indite this passage; but even if spurious it was extant at the time we speak of. Cf. Maitland's Introduction to Bracton's *Note Book* p. 33.

Just here I would like to refer to Dr. Gierke's recently published scholarly work on *Political Theories of the Middle Age*. At pp. 39, 40, he says that it was the well recognized theory of the European jurists in the twelfth century that "the legal title to all Rulership lies in the voluntary and contractual submission of the Ruled". This, it seems to me, is a very remarkable anticipation of the apothegm I have already quoted from the American Declaration of Independence.

The next great and salient instance where the sovereignty of the people constrained the King, was the case of John, of infamous memory. True, John was deposed by the Pope rather than by the English Parliament, and it is also true that the Great Charter was wrung from the pusillanimous King by the people under arms; but the Charter was a triumphant vindication of the amenability of the King to the law. Speaking of the Great Charter during the hey-day of Stuart absolutism, Sir Edward Coke said in Parliament:

> Sovereign power is no parliamentary word. Magna Charta and all our statutes are absolute, without any saving of sovereign power. Take we heed what we yield unto. *Magna Charta is such a fellow that he will have no sovereign.*

Then we come to a most notable occasion in history, when, for the first time after Parliament had assumed its settled form and character, the whole executive government was taken from the King (1), he being ultimately deposed. I speak of the case of Richard II. You remember the story. After repeated quarrels with the Parliament over his tyrannical conduct, his partiality for favourites, such as had been the undoing of Edward II, and his determined policy to subvert the fundamental laws of the land, Parliament declared that it had become

> lawful for his people, by their full and free assent and consent, to depose the King from his royal throne, and in his stead to raise up some other of the Royal race upon the same.

Taswell-Langmead says: (2)

(1) See *Hallam's Mid. Ages*, iii, 59.

(2) *Eng. Cons. Hist.* cap. viii.

Although Richard was induced to resign the Crown, and Henry of Lancaster had laid claim to it, the deposition, the vacancy of the throne, and the subsequent election of Henry, are each recorded in the most distinct terms in the official entry on the rolls of Parliament.

And so passed away the claim of Richard II to legal and political sinlessness.

If you ask me why I pass over the case of Charles I, it is not because I regard that unfortunate monarch as a martyr, but because I look upon those who imbrued their hands in his blood as guilty of regicide. "The indictment, the nomination of a judicial commission, the condemnation of the King," says so impartial and learned an authority as Gneist, (1) "is the gravest act of violence in the whole of English constitutional history—an act which can only occur once in the history of a European nation."

With history to countenance them, the Convention Parliament of 1688-9 had no hesitation in declaring that James II "had broken the original contract between King and people" by violating the fundamental laws and abdicating the Government; nor did they fail to follow up such declaration with a pronouncement that the throne had thereby become vacant. I shall not weary you with a review of the facts of this momentous event in our constitutional history, because I am sure Macaulay's glowing recital of them has not yet failed to irradiate your memories. Suffice it for me to avow the firm conviction that while the Revolution of 1688 apparently resulted in a mere transfer of the executive supremacy of the realm of England from a monarch deposed to a monarch newly chosen, it was in reality a formal and final resumption by the people, through their representatives in the Convention Parliament, of their ancient heritage, the whole and entire supreme power in the State. The Declaration of Right may be said to have been the symbol of a constitutional 'reversion to type'—to use the language of Biology—a getting back, so to speak, from the pseudo-genus of Norman, Tudor and Stuart times to the true genius of the

(1) *Const. Hist. of Eng.* 2nd ed. ii, p. 255.

Anglo-Saxon epoch. From that time forward Lincoln's famous characterization of true popular sovereignty: "Government of the people, by the people, for the people," is practically, although not theoretically, as applicable to the body-politic of modern England as it is to that of the United States of America.

Now, with all deference to the contrary opinion of some great political thinkers, I would submit with some confidence that the Revolution of 1688 did not, as they maintain, witness a delegation by the People to the House of Commons "of the supreme power of the State" (1). It is true that, as a result of the Revolution, the executive power of the Crown, as I have before pointed out, has become vested in the Cabinet, but that is not the supreme power. The present position of the Cabinet was never better described than in the querulous remark of George II:—"Ministers are the King in this Country" (2). As the King lacked the ultimate sovereignty of the realm so do the Ministers lack it now. It is Parliament, in its three parts, that wields the supreme power in the State, by the delegation and authorization of the people, impliedly given or granted. Never has this great constitutional truth been more correctly stated than by Sir Thomas Smith in his *Commonwealth of England* (3), published a century before the Revolution:

> The most high and absolute power of the realm of England consisteth in the Parliament. All that ever the people of Rome might do either *Centuriatis, Comitiis or Tributis*, the same may be done by the Parliament of England. For every Englishman is intended to be there present either in person or by procuration and attorney, of what pre-eminence, state, dignity or quality soever he be, from the prince (be he King or Queen) to the lowest person of England. *And the consent of the Parliament is taken to be every man's consent.*

And I may say, by the way, that in the theory that every man is present in Parliament, either in person or by representative, lies the reason of that apparently hard maxim: "Ignorance of the law excuses no one"; in other words, that

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(1) Cf. J. R. Green's Short Hist. of the Eng People, p. 680.

(2) See Lord Mahon's Hist. of Eng. iii, 280.

(3) Book ii, cap. 2.

a man shall not excuse his wrong-doing by pleading ignorance of the law. It is apparent to the meanest intelligence that the law-maker cannot well be a law-breaker *propter ignorantiam.*

"Here", says Sir Frederick Pollock (1), referring to the above quotation from Smith's *Commonwealth*, "we have the first exposition by any English writer, if not by any European one, of the notion of Sovereignty in its modern amplitude." And Sir Frederick proceeds to show the fallacy of claiming supremacy for the House of Commons simply because it can prevent government from being carried on in opposition to its will. The House of Commons cannot legislate by itself, and its ability to mould legislation by forcing its wishes upon the other constituent parts of Parliament is a matter of practical politics rather than of legal sovereignty.

Father Time has ever manifested a relish for irony, and the records of English constitutional history are not without their laughable side. Who can fail to appreciate, for instance, the magnificent humor of the situation when George III, a hundred years and more after the passage of the Bill of Rights, dismissed Charles James Fox from the Lord Lieutenancy of the West Riding of Yorkshire because at a certain dinner of the Whig Club he gave as a toast: "Our Sovereign—the People"! Of course it is to be said that there was no political significance in this dismissal, and the incident is possibly memorable only to show the dislike that George III, the last of our monarchs to entertain the delusion that Englishmen might be ruled otherwise than according to their will, ever manifested toward Fox In illustration of this dislike, Lord Townshend said that when Fox kissed the King's hand on becoming one of the coalition ministry of 1783, His Majesty "turned back his ears and eyes, just like the horse at Astley's when the tailor he had determined to throw was getting on him." History also records many other instances of this unfortunate monarch's chafing under the

(1) First Book of Jurisprudence, cap. iii.

bit of popular sovereignty, among them the following: Expressing himself in the presence of Lord Chancellor Thurlow to the effect that he would rather retire to Hanover than accept ministers or measures of which he disapproved, the grim lawyer pithily replied: "Your Majesty may go; nothing is more easy; but you may not find it so easy to return when your Majesty becomes tired of staying there" (1).

Although George III, until his reason failed him, zealously sought to bring the independent Kingship out of the study of the *jure divino* doctrinaire into the practical domain of State affairs, it may be said that it disappeared from our political history when his son and successor, George IV, after much perturbation of soul and many overt struggles against the unswerving march of progress of British freedom, consented to the policy of his Ministers in introducing a Bill for Roman Catholic Emancipation in 1829 (2). There have, indeed, since then been one or two shadowy and fleeting reappearances of this constitutional phantasm upon the stage of history, but they only serve to remind us of the royal apparition in *Hamlet*—

> So like the King that was;

and prompt us to ask of it—

> Why the sepulchre,
> Wherein we saw thee quietly inurn'd,
> Hath oped his ponderous and marble jaws
> To cast thee up again?

Listen to some thought-compelling remarks on the present relative positions of Crown and People by a Cambridge Professor, to whom I have already referred in this paper, and of whom I have come to hold the opinion that as an exponent of legal history he has few, if any, equals in Europe to-day. I speak of Professor Maitland. He says: (3)

> In the course of the eighteenth century it became a parliamentary commonplace that 'all political power is a trust'; and this is now so common a commonplace that we seldom think over it. But it was useful. Applied to the Kingly power it gently relaxed that royal chord in our polity which had been racked to the snapping point by

(1) See May's Eng. Const. Hist. cap. i. 64.

(2) Gladstone: *Gleanings*, i, 38, 78.

(3) Introduction to Gierke's *Political Theories of the Middle Age*, p. xxxvi.

Divine Right and State religion. Much easier and much more English was it to make the King a trustee for his people than to call him officer, official, functionary or even first magistrate. . . . Much has happened within and behind that thought of the King's trusteeship; even a civil death of personal government, an euthanasia of monarchy. And now, in the year 1900, the banished Commonwealth, purged of regicidal guilt, comes back to us from Australia, and is inlawed by Act of Parliament.

And here is the voice of the very latest witness I can summon to my support:

After long wanderings through many fields of speculation, as well as many a hard-fought fight, all civilized nations have come back the point from which the Romans started twenty centuries ago. All hold, as did the Romans that sovereign power comes in the last resort from the people, and that whoever exercises it in a State, exercises it by delegation from the people. (1)

With these quotations I feel that I may very safely rest the case for *The Sovereign People of Great Britain* v. *His Majesty the King*.

I trust I am not presumptuous when I venture to think that the authorities I have marshalled support to a very satisfactory degree the thesis advanced in this paper, which may be recapitulated as follows, namely: That the maxim that 'the King can do no wrong' is a constitutional dogma entirely out of harmony with the genius of free institutions within the British Empire; that the history of England shows that in all political crises the maxim has been 'more honour'd in the breach than the observance'; and, lastly, that it is a 'fond thing, vainly invented' by the mediæval attorneys, presumably to further the interests of their clients with the King. Yet, notwithstanding the evidence I have given you that the King is not superior to the law, that he is not incapable of doing legal wrong, and that he may be deposed from his office by the will of the people, the 7th edition of Broom's *Legal Maxims*, published in the year 1900 (2) calmly tells us that "the principal attributes of the Crown are sovereignty, or pre-eminence, perfection and perpetuity; and these attributes are attached to the wearer of the Crown by the Constitution, and may be said to form his constitutional character and royal dignity."

(1) Bryce: *Studies in the History of Jurisprudence* ii, p. 110.
(2) Cap. ii, p. 33.

Alas, the evil done by those old attorneys does indeed live after them!

"The ideal King of the lawyers, says Allen (1), "is a King above the law; the real King of the Constitution is a King subject to the law."

Walter Bagehot, in his unique work on the Constitution, says: (2)

> If any one will run over the pages of Comyn's Digest, or any other such book, title 'Prerogative,' he will find the Queen has a hundred powers which waver between reality and desuetude, and which would cause a protracted and very interesting legal argument if she tried to exercise them. Some good lawyer ought to write a careful book to say which of these powers are really usable, and which are obsolete There is no authentic explicit information as to what the Queen can do, any more than of what she does.

To quote for the last time from Professor Freeman (3)

> The whole conception of the Sovereign as one, personally at least, above the law, as one personally irresponsible and incapable of doing wrong . . . . . is purely a lawyer's conception, and rests upon no ground whatever in the records of our early history.

Now I fancy that by reason of what I have just said and quoted the suspicion of a smile at the expense of the integrity and good judgment of the Bar will beset the countenances of those who have not the honour of belonging to that profession. Be it so. It is to the credit of the profession that they can stand well-founded criticism of this sort without any sense of shock or dismay. Unlike the ideal King of their seventeenth century doctrine, it is possible for them to make mistakes. But, on the other hand, those mistakes are few, and they are not ashamed to correct them upon conviction of error. The master-masons of the splendid structure of English Jurisprudence are not going to be dismissed as unworthy servants of their country because, in a moment of weakness, they builded one of the more ornamental parts of the edifice a little worse than they knew.

I have not been careful to explain that my observations on the royal prerogative are just as applicable to the body-politic

(1) *Inquiry into Prerog., &c.*, p. 34.
(2) *The Eng. Const.* pp. 58, 59.
(3) *Growth of Eng. Cons.* cap. iii.

in Canada as to that of the mother-country; because that the prerogatives of the Crown, so far as they intersect the domain of colonial legislative powers, are as amenable to parliamentary control here as they are in England, is a matter of which every political student is cognizant. But our forefathers did not obtain the proud measure of constitutional liberty that lies behind that declaration without a series of conflicts which searched the very marrow of the stuff whereof they were made. Only in the travail of great souls may civil liberty be born. In Nova Scotia and New Brunswick we repeated, in miniature, the post-Conquest history of Constitution-building in England, starting with a sort of *Curia Regis*, represented by an autocratic Governor and his Council, and ending with a form of representative Government which bears upon it the hall-mark of the truest freedom. In Prince Edward Island the attainment of a similar boon was complicated and retarded by a system of landlordism which reproduced some of the worst features of feudal tenures in the middle ages. In the two Canadas it was in the dispensation of Providence that civil war should lay its baleful shadow over the land before the people should be privileged to greet the coming of free political institutions in the train of 'white-robed Peace'. And so in these detached provinces were laid the foundation-stones of constitutional liberty and self-reliance upon which the great Dominion was thereafter to be built by the genius of native statesmen. Was not their conception of a federal State the best possible cement to unite these segregated political crystals? And may I not justly ask if the world has ever seen better nation-building than theirs, and that, too, in the face of obstacles which to the mind of the speculative publicist seemed wholly insurmountable?

And so I am brought to conclude the examination of my theme with the observation that inasmuch as the executive power of Government is now in the hands of the Cabinet, both Lord Salisbury in England and Sir Wilfred Laurier in Canada have more concern with the maxim *Rex non potest*

peccare than His Most Excellent Majesty, King Edward the Seventh. Indeed, if it were permitted to one to be curt in his expressions touching so august a matter, one might be tempted to aver that to-day the King is impeccable for the very simple reason that he has no power to do wrong.

It remains to be said that the Executive can do no wrong, because, in their sphere, they represent the Sovereign People. *

What then? Shall we say that as the English people have come round again to their old-time way of democratic thinking, we no longer ought to retain the fiction of Kingship? God forbid. We must not forget that we had Kings in the days of our purest democracy. A hereditary King with the checks and restraints that hedge him about under the modernized Constitution, is the very best sort of a President that our veiled republic can possibly have. We thus escape all the exacerbations of periodical elections; and, on the other hand, we have the advantage of the holder of the office always knowing his place—an inestimable quality, for then we miss all those crude impolicies which usually characterize the novitiate of the holder of an elective office. Then, again, there is the consideration, not as trifling as it would on the surface appear, that with a hereditary aristocracy still in the vigour of its prime like that of England, it would be an anomalous and unfortunate thing for the chiefest and most picturesque figure in the social life of the nation to be constantly changing its personality.

No, beyond a doubt the time has not arrived for any overt modification in our Constitution touching its manifest head. Nor need we citizens of this young Dominion be fearful of any fierce revolutionary upheaval in the future, should the interest of the British people as a whole demand some such modification. We have only to remember that history unfolds a splendid record of the self-control and discretion of our race under the the strain of constitutional

* This principle is recognized in the American theory of Government See opinion of Gray, J. in Briggs v Light Boats, 11 Allen at p. 162.

crises. Nor do we, who stand upon the threshold of still mightier enterprises in Empire-building than the Past has witnessed, lack counsels of hope and guidance from the great Englishmen of former times whose souls expatiated in the pure ether of freedom :

Consider, says Milton, consider that nation whereof ye are; a nation not slow and dull, but of a quick, ingenious, and piercing spirit; acute to invent, subtile and sinewy to discourse; not beneath the reach of any point that human capacity can soar .

And then he continues in these magnificent words, which may well stand as the literary embodiment of a prophetic vision of the Greater Britain—the true Commonwealth of Freemen—which this century seems destined to create :

Methinks I see in my mind a noble and puissant nation raising herself like a strong man after sleep, and shaking her invincible locks; methinks I see her as an eagle, mewing her mighty youth and kindling her undazzled eyes at the full midday beam; purging and unscaling her long-abused sight at the fountain itself of heavenly radiance; while the whole noise of timorous and flocking birds, with those also that love the twilight, flutter about, amazed at what she means

It is popular sovereignty, as it was conceived by the builders of the English Constitution, that will make the realization of such a vision possible—

Nought shall make us rue
If England to itself do rest but true !

COUNCIL OF THE SOCIETY.

1901-1902.

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H. H. Bligh, K.C., - - - *1st Vice-President.*

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No. 4. 1906-07.

TRANSACTIONS

OF THE

Ottawa Literary and Scientific Society

PRICE 50 CENTS.

OTTAWA:
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1907.

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ADDRESS AT THE OPENING OF THE WINTER COURSE OF LECTURES, OTTAWA LITERARY AND SCIENTIFIC SOCIETY, NOVEMBER 23RD, 1906.

By Otto Klotz, President.

It gives me much pleasure to greet you to this, the opening meeting of our winter course of lectures.

The history of our Society has been presented to you in former years, especially by our veteran ex-president, Dr. W. D. LeSueur—to whom the Society owes so much—that I will not dilate thereon now.

However, I may say that our membership is nearly 300 and that our finances are in so far satisfactory that we have no debts and have a substantial figure to our credit in the bank.

The past year in Ottawa has been marked by an event that cannot but be fraught with great good to the people of Ottawa and which will also, it is hoped, prove a benefit to the Literary and Scientific Society. I refer of course to the opening of the Carnegie Library. It is but a few months since this took place, and already some ten thousand have availed themselves of the privileges thus made available. This in itself is ample justification for the existence of the institution, the usefulness of which is, however, but in its infant stage; let us hope that as time passes there will not be a home in Ottawa which shall not be directly or indirectly benefitted by its humanizing and elevating influences.

That the library may occupy the position it should as an educational factor in the community, it must receive adequate support from the City Treasury for the purchase of books and magazines, and ultimately for the technical instruction of our artisans, not to mention the maintenance of a staff commensurate with its requirements. The present supply of books falls visibly short of the immediate needs.

When the library building was designed, a small hall was set apart for the purpose of meetings of a literary and scientific character, meetings that should be free and open to the public, and at which subjects more or less popular in character should be discussed, for it was considered eminently fitting, that addresses and lectures having "the diffusion of knowledge" in view should be

offered to the public, in connection with a library supported by whole the people, and in which every citizen has a personal and direct interest.

The Council of our Society some years ago, recognizing the fact that its annual course of lectures should be available for a larger circle than that of its members, abolished the fees for the course and made the lectures absolutely free and open to the public, and this to some degree has been appreciated, although not to the extent desired. It must be admitted that the great mass of the people is not hungering for intellectual development, but is rather in search of amusement, entertainment, such forms of diversions as involve little or no mental exertion and stimulate only the more primitive faculties of the mind. The wheels of progress of the world are, it cannot be denied, kept in motion by the few. And so it is that all public meetings and addresses that have an educational object are patronized by a very much smaller number than is to be found at a football match.

The rooms of the Society being somewhat limited for public meetings, it was decided to avail ourselves of the hall in the library which has been kindly placed at our disposal, an accommodation for which I wish at this first opportunity to express the thanks of the Society.

A word as to the situation created by the opening of the Carnegie Library with reference to our Society.

As until this year there was no public library in the City, the Society felt it its duty to minister as far as its limited means permitted, to the needs of the community and thereby became a quasi public library, at the cost of departing to some extent from the purpose for which it was declared to be founded, "the cultivation of literature and science." It would seem therefore, that the opening of the Carnegie Library should further the interests of the Literary and Scientific Society by relieving it of the task of supplying general reading matter, especially of the more ephemeral kind, and thereby permitting more attention to be bestowed in another direction.

In a society like ours, it seems to me that the most important object to accomplish is to cultivate the living element, rather than to accumulate books; books should only be means to an end. I have for years recognized that we have here in Ottawa more literary and scientific men and women in proportion to population than any other city in Canada, and on the other hand I have de-

plored for a long time the absence of adequate facilities for these persons to meet, become acquainted with each other, and by attrition of thought and interchange of knowledge and opinion, foster a true literary and scientific spirit. When the Carnegie offer of $100,000 was received, the opinion was expressed in some quarters that Ottawa's wealthy citizens should have been approached, and that, had this been done, the appeal would have been adequately answered. The public library is built, but we want, Ottawa wants, Ottawa requires, an institution that shall be a home, a meeting place, open daily, for its literary and scientific people; consequently the generosity of our wealthy men need not go in search of an opportunity of bestowing on the city a further very material benefit. I do not like to make comparisons between ourselves and the people living to the south of us, but we must admit that their opulent citizens appear to vie with each other in donating moneys for the public weal directly, as in the case of public libraries, or educational institutions, and indirectly through facilitating the work of such societies as ours.

A building such as I have in view could be erected for $50,000, and its further maintenance could undoubtedly be borne by those interested in intellectual progress.

Think of the number of literary and scientific men in Ottawa who now are merely entities, no link, no binding element between them, no gravitating point, no magnetic field surrounding them, but compelled as individual atoms to float through space and off the stage without having discharged their duties and responsibilities to themselves and to their fellow citizens as they ought. Such men as a rule have but slender means, and in any large undertaking must look for assistance to the wealthier men of the community. I am not pleading exclusively for the Ottawa Literary and Scientific Society, I am pleading for all our men and women who are devoting much of their time to intellectual work, be it of a literary, historical, economic or scientific character. The day of the recluse is past; co-operation, commingling of thoughts, combination of efforts, are the watchwords for advancement; and let no one for a moment imagine that the advancement of any part of the community, and particularly of its intellectual class, does not influence and affect beneficially the whole social body, and in ever widening circles permeate the life of the nation.

Our distinguished premier, Sir Wilfrid Laurier, declared many years ago that Ottawa should become the intellectual centre of the Dominion; and nothing I take it, would sooner bring about that

result than the welding together of the material we already have here into one vital whole by giving it a headquarters and a home—I insist upon a home, for personal contact and intercourse are essential conditions of intellectual life and progress.

We want something more than an annual course of lectures, however instructive and interesting; we want something more than mere books. We want the smouldering intellectual fires to be fanned into flame. We want the opportunity for enlarged and fruitful activity. Just as the crude gem receives new value by rubbing against matter of its own substance, so the faculties of man are aroused, brought forth and polished by rubbing against those of others.

The transactions of the Society which were founded some years ago and of which three numbers have been issued, should and must, now that our activities will be devoted more and more to their true purpose, be issued regularly. The value of the transactions is two-fold: in the first place, as a medium for putting in a permanent form the work of members who are contributing to the increase of knowledge; and in the second place, as a means of offering a *quid pro quo* for the similar publications of other societies the world over. The latter means that we are put in direct touch with the whole literary and scientific world, a circumstance of the very highest importance. We have already a fair exchange list, but it can be largely increased. The issuing of transactions will undoubtedly hereafter constitute our main claim upon the annual support and grant from the Ontario Government.

The capital of every nation is, if not its commercial, its intellectual centre, and this Ottawa should be for Canada. It is already the Mecca of many. The development of Canada, of any country, is essentially a matter of brain power.

We hear much these days of the City Beautiful, and of making Ottawa a city beautiful, a desire, I am sure, in which all our citizens most heartily participate. But this, as commonly understood, has reference exclusively to the material adornment and embellishment of the city. A true City Beautiful is one in which material and intellectual improvement go hand in hand.

The time is eminently ripe for a movement leading to the founding of such an institution as I have indicated.

I am uttering these words in the hope that they may reach a responsive ear, and also to discharge a duty that I feel I owe to my fellow-citizens to whom the matter is assuredly one of deep and serious interest.

The Causes that Lead to the War of 1812

By B. Sulte, F. R. S. C.

[*Delivered Nov.* 23, 1906.

What is here offered is not a connected account of the events which occurred between the years 1785 and 1811, leading to a renewal of war between Great Britain and the United States, but simply a sketch of the principal subjects of dispute and grievance between the two powers. I limit my treatment of the subject so as not to exceed the measure of a paper suitable to the present occasion. Limitation, in this case, means considerable condensation.

As regards facility of communication with England and the rest of the world, Canada was at this period on about the same footing as England had been in regard to Rome some two thousand years earlier. The mail between Quebec, Halifax and New York was only monthly, and even so was subject to irregularity. In the *Quebec Gazette* of the 10th November 1792 it is stated that the latest news from Philadelphia is to the 8th October and relates to a battle on the Wabash river between an expedition under the American general Wilkinson, and a body of Indians. Again on the 29th December we read: "Yesterday's post from Montreal brought New York papers to the 27th November." In those days the mail from England took two months to reach Halifax. In 1791 this mail, which before was monthly only, was made fortnightly.

The shipping employed in the foreign trade of Canada—if that term can be applied to her trade with Great Britain and her dependencies—is shewn by the following statement taken from the *Quebec Gazette* of the 17th November, 1791: 36 ships, 1 snow, 47 brigs, and 6 schooners, or 90 vessels in all. In 1805 the total had increased to 146 vessels with an aggregate burthen of 25,136 tons; in 106, to 191 vessels, chiefly square-rigged, with an aggregate burthen of 33,474 tons.

The finances of the Province were not under the control of the House of Assembly, but under that of the Governor General

and his advisers. In opening the Legislature at Quebec in November, 1793, Lord Dorchester said that he would cause to be laid before the House of Assembly a complete statement of the receipts of provincial revenue since the separation of Upper from Lower Canada. The expenditure, he observed at the same time, had been very heavy and could not all be laid to provincial account. The fact was that money was spent lavishly on sinecures which the Assembly would have wished to see abolished. In its address in reply the House politely observed: "By receiving from Your Excellency an account of the receipts of the provincial revenues of the Crown, we shall be enabled to deliberate on the means by which they may be rendered more productive; and penetrated with gratitude to the parent state for having hitherto defrayed the surplus expenditure of the Province, we flatter ourselves that, in consideration of our situation, we shall continue to experience her generous assistance; a hope further strengthened by Your Excellency's intention of not requiring from us any subsidy at present, which confirms the benevolence of our mother country."

The gross receipts were as follows:—

Casual and territorial	£ 720
Duties	3771
Licenses	1013
	£5,504 stg.

In 1794 the amount had increased to £8,623.

The expense of the civil government was in reality £25,000 a year, the heavy deficit being met by the Imperial Treasury. There was no provincial debt.

In the same session a militia bill was passed which, repealing the ordinances previously in force, substituted provisions better adapted to the circumstances of the Province. It is worthy of note that this measure was carried unanimously in a House composed mainly of French Canadians; the true spirit of the population was thus clearly manifested. The younger generation of that day hardly remembered the events of 1775, the date of the last war, but they were ready to shoulder their guns, as their forefathers had done, for the defence of the country.

The Legislature was at the same time asked to pass an Alien Law establishing "regulations respecting foreigners and certain subjects of His Majesty who have resided in France coming into this province and residing therein, and for empowering His Majesty

to secure and detain persons charged with or suspected of high treason, and for the arrest and commitment of all persons who may individually, by seditious practices, attempt to disturb the government of this province."

Robert Christie in his *History of Lower Canada*, 1848, adds: "It would seem by a proclamation of Lord Dorchester, dated at Quebec, 26th November, 1793, that there were emissaries from France, or others (Americans?) in the province, busying themselves in propagating in it the revolutionary principles of that country in those times. The proclamation alluded to stated that:—'Whereas divers evil-disposed persons had lately manifested seditious and wicked attempts to alienate the affections of His Majesty's loyal subjects, by false representations of the cause and conduct of the persons at present exercising the supreme authority in France, and particularly certain foreigners, being alien enemies, who are lurking and lie concealed in various parts of this province, acting in concert wth persons in foreign dominions, with a view to forward the criminal purposes of such persons, enemies of the peace and happiness of the inhabitants of this province, and of all religion, government and order,' His Excellency, therefore, required all magistrates in and throughout the province, captains of militia, peace officers, and others of His Majesty's good subjects, to be vigilant, and to do their utmost to discover and secure all and every person who might hold seditious discourses, or utter treasonable words, spread false news, publish or distribute libellous papers, written or printed, tending to excite discontent, or lessen the affections of His Majesty's subjects, or in any manner to disturb the peace and happiness under His Majesty's government in this colony, &c.'"

Those were the days of Robespierre and 1793, the year of the Terror in France. I have seen letters addressed by the secretary to the Governor General for the information of some of our families pointing out the impossibility to admit their sons in Canada after following a course of regular instruction in Paris, because the young men were suspected of being imbued with the current principles of the Revolution. The measure recommended here by Lord Dorchester passed the Legislative Assembly without opposition and the obnoxious foreigners went back to the French embassy at Washington to report the failure of their mission.

The Alien Bill did not, however, completely rid the Province of conspirators. In 1796 General Robert Prescott found it neces-

sary to renew the instructions to magistrates and others in authority to watch closely all strangers moving from place to place in the Province without any apparent purpose; and in the following year David McLean, an American citizen, was apprehended on a charge of high treason. The plan conceived by this man was nothing less than the extirpation of British power from the continent of America. A beginning was to be made at Quebec, which was to be taken by surprise. His trial brought out full details of the organization set on foot for this purpose. He represented himself as a General in the French service, and as acting under the immediate direction of Mr. Adet, the minister of Barras in the United States. He was condemned to death and executed at Quebec.

Some years before 1812 General Tureau, French ambassador at Washington tried to get into communication with the people of Lower Canada, but was made the victim of an elaborate joke. Some one wrote him a letter speaking most hopefully of the chances of French intervention, and giving a perfectly absurd account of the state of affairs in this country. Absurd as it was, however, he was completely taken in, and sent the letter to Paris where it appears it was accepted as an authentic document. The names appended to the letter with their titles, etc., were all purely imaginary.

The idea of protecting home industries had spread in the New England States, and the result was the enacting of a tariff against English goods. It soon became evident, however, that a large illicit trade was being carried on across the extensive and almost wholly unguarded Canadian border. Vessels from Great Britain entering the St. Lawrence delivered their cargoes at Bic, Quebec or Montreal, as the case might be, and thence goods were clandestinely conveyed to the other side of the line, to the serious injury of American manufacturing interests. Mention is made of a particular smuggler who justified his operations by saying that he had "declared war against the United States."

The greatest concentration of American manufacturing enterprise was in Massachusetts, and it was there consequently that the spirit of retaliation first found expression. The people of that state shrewdly calculated, moreover, that in case of war they would have the furnishing of the larger part of the equipment required by the troops. The Canadians of course, as intermediaries of the contraband trade, came in for their due proportion of American ill-will.

The soil of Lower Canada, well-adopted to the cultivation of wheat, flax, hemp, etc., supported an extensive exportation of those products. Coal-tar and masts were also in great demand at that time. Ships were built on the St. Lawrence and sold to England. In those golden days—"les bonnes années" as they were called—everything in the way of business was brisk in Canada. The British navy escorted our ships to England, and Nelson, who kept the way clear on the ocean was immensely popular in this country.

The only cloud in this bright sky was the conflict that was going on between the regime of Downing Street and the natural tendency of the colony towards self-government. It was Canada's ambition and purpose to escape from the bonds of a Crown Colony, and the sentiment of the country on this question was strongly reflected and expressed in the debates in the House of Assembly at Quebec. The political situation in Lower Canada had indeed become critical. The antagonism between certain public functionaries and the representatives of the people had reached an acute stage. Sir James Craig, who became Governor in 1807, inflamed public feeling by certain unnecessary acts of rigour. On the very eve of war the country was exasperated against its own government. Very fortunately Sir James left the country in 1811. Before doing so he had sent a secret agent to the United States to obtain information as to their resources and condition of preparation; but when the bill of costs came to be submitted, the Imperial government refused to pay it, whereupon Henry, the agent, sold the information to the United States, which did not improve the condition of feeling on either side.

The preparations for war on this side were certainly very slight, all the regular troops in the country amounting only to a few hundreds; while the scanty population of Upper Canada could scarcely be expected to afford much help. On Lower Canada, with its united organization, the chief dependence had to be placed; from its situation that Province would also be the chief base of military operations.

Considering the state of political feeling in Lower Canada it was a question what part the French population would take in case of war. Would they support the British flag? The calculations of the Americans was that at most they would remain neutral; yet, when the declaration of war reached Quebec, the Legislative Assembly voted subsidies in excess of what was asked of them, and that promptly and unanimously. The Americans proceeded,

nevertheless, to form a plan for the occupation of the Province, feeling confident that, if they succeeded in this, the Upper Province would fall into their hands as a matter of course.

During the summer of 1807, says Christie, "there were serious apprehensions of war with the United States, whose interests were suffering between the two great belligerents of Europe. The feeling of hostility throughout the Republic was aggravated by the affair between the *Leopard* and the *Chesapeake*, in which the former had fired . . . for the purpose of searching her, and had taken from her four deserters, unhappily killing six men and wounding twenty-six others."

One-fifth of the militia was drafted without delay and put under drill. In 1808 the fortifications of Quebec were commenced.

"The extraordinary state of affairs in Europe, with the American non-intercourse and embargo system, operated favourably for the Canadian trade, particularly in the article of lumber, which, owing to the quasi exclusion of the British from the Baltic, took about this time, a prodigious start, evincing at once the independence of Great Britain on a foreign power, for that article, and consequently the value of her continental North American possessions, taking in return for their timber, large supplies of British manufactures." (Christie.)

In the year 1810 the number of vessels entered and cleared at Quebec was 635 with a tonnage of 138,057. The vessels built at that place and cleared numbered 26—with a tonnage of 5,836. The revenue of the province was £68,000 and the expenditure £42,000.

The total population of the two Provinces did not at the time exceed 300,000 souls, while that of the United States numbered 8,000,000 at least. The fortune of war, however, is not always a matter of numbers; the issue may be governed by some totally different circumstance or condition. The confidence of the Americans was unbounded. Their Secretary of War boasted in public speeches and official papers that "We can take the Canadas without soldiers. We have only to send officers into the Provinces and the people disaffected toward their own Government will rally round our standard." Mr. Henry Clay said in the Congress: "It is absurd to suppose we shall not succeed. We have the Canadas as much under our command as Great Britain has the ocean, and the way to conquer on the seas is to drive her from the land. I am not for stopping at Quebec, or

anywhere else, but I would take the whole continent from them and ask no favors. God has given us the power and the means: we are to blame if we do not use them." (1)

The dispute respecting the "right of search," which had occupied diplomacy for some years, was eventually made the pretext for war. Deserters from the British navy were in the habit of joining American vessels; and, according to international law at the time, the English had the right of stopping foreign vessels on the high seas and looking for such men. This no doubt at times was annoying and the ill-will existing in the United States against England converted it unto a grievance of the first magnitude. The history of these difficulties is a long and complicated one and may be studied in many well-known works.

It is due to the wisdom of the Duke of Kent, father of the late Queen, that we were able in 1812 to provide the militia of Lower Canada with a certain number of trained officers of their own origin. As early as 1792, His Royal Highness had managed to procure several commissions in the Imperial service for young French Canadians of military tastes and these, after having gone round the world with the British Army, were now recalled to Canada in the hour of danger. Mention must also be made of the non-commissioned officers and soldiers born in the Province, and drilled in the regular regiments in which they had enlisted who made themselves very useful as instructors to the militia. If we take further into account the British officers then serving in the country, it is clear that the rank and file of our forces did not lack the means of becoming familiar with military drill and tactics. On the contrary they had such means in abundance. The case was altogether different with the Americans who were miserably deficient in officers and instructors. Their troops therefore could not be brought to a condition of efficiency, whereas on our side every man soon became a real soldier. In the matter of equipment all, on their side, at the outset was unpreparedness, while their experience in the way of manufacturing what they required was very limited. On this side conditions were different: the stores of the British army supplied all our needs at a moment's notice. After a few months of hostilities the Americans perceived that they could not rush matters as they had expected; their operations

(1) *The Star*, Montreal, 27th October, 1906.

consequently flagged, and the time thus lost was never regained, because the affairs of Napoleon in Europe were turning out badly, and upon him, as we shall shortly see, they were mainly depending to keep Great Britain on the strain.

It may be new to some readers of this paper if I say that Napoleon was associated with the Americans in this matter, and even that without the hopes reposed in him the war would never have taken place. This must now be explained; and we shall see further that the war in Canada came to an end because of his defeat.

After the decree of 1806 the whole of Europe was practically closed to British trade, and it was a subject of surprise to find that England nevertheless continued to receive her supplies much as usual. It was some time before it was recognized that the source of supply was Canada. It was difficult indeed for France to realize that a colony, which in her hands had been, commercially speaking, so insignificant, should now be playing so important a part in a great crisis. When the fact forced itself on general attention, Napoleon had all his plans made for a campaign against Russia. He knew the disposition of the American people towards England, and he at once conceived the possibility of giving the British troops so much to do in Europe—England being allied with Russia—that the defence of Canada against an American attack would be impossible; and the cabinet at Washington fell in with the scheme. The declaration of war was signed by the Emperor of the French on the 18th June 1812, and on the same day President Madison signed a similar document addressed to the British government.

The force at the disposal of General Prevost was so small that it was out of his power to assume the offensive; he therefore simply awaited attack. On the other side, however, there was no army in readiness, and it took months to organize one and render it in some small measure effective. General Brock, in command in Upper Canada, took the bold step of marching to Detroit, which he captured together with the much superior army, in point of numbers, of the American General Hull. A little later the Americans invaded our territory, and were defeated by Brock at Queenston Heights on the 13th of October, 1812, though the day was marred for the British side by the death of that brave and capable general. By that time the news from Europe showed that the French army under Napoleon had fallen into a trap, and

our neighbours thought it prudent therefore to suspend operations. Their movements during the summer of 1813 were very slack, as the situation of Napoleon continued to be precarious; but as soon as it became known that he had won three or four battles in Germany, they advanced in force on Upper and Lower Canada. This was in the autumn of the same year. Then followed the battle of the Thames in Upper Canada where the invaders were victorious, the battle of Chateauguay where they met a sharp and decisive defeat, and the affair at Chrysler's Farm, where they were also worsted, with the result of checking their advance on Montreal. The defeat of Napoleon at Leipsic made the outlook somewhat gloomy for them; and during the winter of 1813–14 their operations were at a standstill. On the opening of navigation fourteen British regiments arrived at Quebec, and with them came the news that Napoleon had been sent to the island of Elba. The summer passed pretty quietly.

The hostilities carried on during the year 1814 were on the whole unfavorable to the Americans. The most disastrous effects of the war were felt in the manufacturing states of New England, and there the peace party was loudly clamoring for the cessation of the fruitless war. Trade, navigation and commerce were ruined. The public treasury, whose revenue was mostly from customs duties until 1812, was empty and a loan of twenty million dollars had to be made. Two-thirds of the merchants had become insolvent.

Happily for both countries the news reached Canada in March, 1815, that peace had been concluded between Great Britain and the United States by the Treaty of Ghent (Dec. 24, 1814). By this treaty all captured territory was restored and the boundaries of Canada remained undisturbed. Had the war on our frontier been prolonged the defeat of Napoleon at Waterloo (June 18, 1815) would have released a vast body of British troops and given a very different complexion to the struggle.

The reader can now see how closely this war of ours was linked with what was going on in Europe, and judging by the attitude of the Americans after the arrival of reinforcements in 1814, it is reasonable to conclude that no hostilities would have been attempted on the Canadian frontier if peace had reigned in Europe.

It is quite true that if the war had been begun without any

dependence on the success of Napoleon, the Americans would probably have thrown a much larger army than they did across the border, but in that event the British army would have been available for the protection of our country.

We must not forget that a war causes many changes in the economy of a nation. In this case, the United States learned how to provide for themselves in the way of manufactures, and the lesson was not lost. A similar effect was produced in Canada by the development of her natural resources consequent in demands which the war created.

The Southern Trail in British Columbia.

By J. M. Macoun, Assistant Naturalist, Geological Survey.

[*Read November 30th,* 1906.

Within five years one, or probably two railways will cross British Columbia close to the international boundary, and as happened elsewhere in that province many of the old trails will then be abandoned. Some of them, indeed, follow the only available routes and the building of a railway means their destruction. There was room for only one road up the Fraser, for example, and the Canadian Pacific Railway replaced the old Cariboo trail which was the main route from the coast to the mines and trading posts of northern British Columbia. Some account of the early history of the fur-trading companies and of the discovery of gold is necessary in order to understand the causes which lead to the development of Southern British Columbia.

Fraser and Stuart crossing from the east side of the mountains descended the Fraser in 1808. Thompson came down the Columbia in 1811, and in 1813 the Pacific Trading Co.—Astor's company—sold out to the Northwest Trading Co. This company and the Hudson's Bay Co., after years of conflict, joined forces in 1821, thus leaving all the routes from the Pacific coast into the interior in the hands of the Hudson's Bay Co. It was not until 1826, however, that all the goods for the northern parts were taken from the west northwestward. In July of that year the first brigade left Fort Vancouver with supplies for the northern posts and dispatches for York Factory.

Though several histories of the Hudson's Bay Company have been published in recent years none of them begins to do justice to the men who were the pioneers in British Columbia. Chosen for their courage and strength to withstand hardship they were for the most part men who under other conditions would have made great generals or statesmen. The diplomacy necessary to

Much of the historical matter which follows has been gleaned from Bancroft's "History of the Northwest Coast."

deal successfully with savage tribes and rival traders, the ability to organize forces, insignificant in number, so as to withstand the attacks of blood-thirsty Indians bent on plunder and revenge or to take the aggressive when it seemed politic to do so, called for brains and bravery far above the average, and when these seemed wanting no man held a position of responsibility for long. With gun or pistol always within easy reach they were prompt to defend themselves, and seldom hesitated to take the initiative when treachery was found. They were sent out not only to buy furs, but to monopolize the trade, and, honest in their dealings with one another, they were not over-scrupulous in their dealings with rivals. They held the country for Britain, however, and had they not been there it is doubtful whether Canada would not have ended at the Rocky mountains.

The first attempts at agriculture north of San Francisco and west of the Rockies were made at Fort Colville in 1825, but the soil was dry and irrigation unthought of, so the results were not encouraging. Agriculture was in a way forced upon the Hudson's Bay Company. The early history of this great company in the northwest is its history in British Columbia and Oregon. It is doubtless true that when the fur-trade of the northwest was threatened by the arrival of settlers the Hudson's Bay Company, through its officials, did all that it could to minimize the agricultural possibilities of the country, but in the earlier years little attempt was made to grow either grain or vegetables, and anyone who has visited the remote Hudson's Bay posts of the present day will understand the reason. These posts are fur-trading posts, and the lives of the traders differ very little from those of the natives. Their food is game and fish and the fruits of the forest. To clear the land, to plant and harvest crops, required time that could be ill spared from the needs of the trade, for the duties of a collector of furs took him far from his post; and at the season when crops would require attention the business of the fur-trade might require his presence hundreds of miles away. If this be true to-day how much more difficult it was in the early years of the last century to plant and care for crops when that whole vast district was in charge of only a score or so of men, whose sole object in life was to collect furs for the company. No trust or monopoly of these times had such power over its employees as was wielded by the old fur-trading companies, and on the other hand it may be said that the loyalty of the Company's servants

would be sought for without finding in these days. Agriculture was, as I have said, in a way forced upon the Hudson's Bay Company. According to the terms of an agreement between the Hudson's Bay Company and the Russian American Fur Company, the former company was to supply the latter with all the agricultural products the Russian posts and vessels might require. What little planting had been done around Fort Vancouver, Fort Colville and in some of the valleys of what is now the state of Washington barely sufficed for the needs of the Company's servants, so in 1839 it was decided to open up farms along the banks of the Columbia, and in that year English and Scotch farmers were brought across the mountains from Canada. Many French-Canadians who had left the Company's service were also encouraged to engage in agriculture so that the first agricultural settlements in the Willamette and Columbia valleys were made by Canadians.

As the trade of the interior was developed, the traffic along the northern route increased, and up to 1846 the whole trade of the interior of British Columbia was done via the Columbia River. If the British Columbian boundary had remained where it was thought to be before 1846 it is not at all likely that a transcontinental route through what is now Canada would be in operation to-day.

Before 1846 when the treaty of Oregon was signed, which fixed the southern boundary of British Columbia, Fort Vancouver 150 miles from the mouth of the Columbia was the chief port of the Hudson's Bay Company. The first effect of the moving north of the International Boundary was to make it necessary that a British company trading in British territory should establish a new post from which supplies might be sent to the north and east. What with the customs duties imposed by the U.S. Government and the inconvenience and delay that might be caused by unfriendly officials, to continue using Fort Vancouver as a port of entry was not to be thought of if it could be avoided. The Columbia river and the open country between Fort Colville and Kamloops had afforded a comparatively easy and safe transport route from the sea to the interior and before abandoning it another must be sought. The Fraser valley was out of the question. Its deep canyons and wild rapids presented difficulties thought to be unsurmountable at that time. The trading posts throughout northern British Columbia were nearly all supplied from

Kamloops and with Kamloops for an objective point explorers in the employ of the Hudson's Bay Company examined every available route from the coast. After some hesitation it was decided to leave the Fraser at Hope, ascend a branch of the Coquihalla, cross to the Skagit and from the head of that stream to the Tulameen, whence there was an easy route to Kamloops. This route was explored and mapped by Mr. A. C. Anderson, who was in charge of Fort Alexandria on the Fraser River. Anderson had made several attempts to locate more direct routes, but all were rejected as too dangerous or difficult, and many were the difficulties to be overcome before the route selected by him was made safe for loaded animals. It was not until the need of good pack-trails to the Boundary was made necessary in 1860 that this trail was put into good condition.

No account of southern British Columbia by a naturalist should omit mention of David Douglas, the botanist, who added over 1,000 species to the known flora of America. His explorations from California to the upper Columbia covered a period of ten years—from 1824 to 1834, and for the greater part of the time he travelled alone. A white man alone was never safe from Indians at that time, and many are the stories told of Douglas' ways of making them fear and respect him. It was he who first showed these Indians that a bird on the wing might be brought down by a shot-gun. A little effervescing powder thrown into water proved to them that he could drink boiling water with impunity and by lighting his pipe with a lens he showed that he could call down fire from heaven. They were not less astonished at his shooting cones from tall trees than that he should want such things. He had the man of science scorn for the ways of the money-getter, and though under great obligations to the Hudson's Bay Company, he lost no opportunity of telling the servants of the company what he thought of them and their business.

Though only indirectly bearing on the subject of my address, some account of the gold excitement that led to the development of the interior of British Columbia will not be out of place. It was at its height in 1858-59. Gold had been discovered in paying quantities the previous year. The knowledge of the occurrence of gold in British Columbia soon spread, and it was everywhere believed that a new California had been discovered. Thousands of miners and adventurers flocked to Victoria, and according to the

San Francisco newspapers of the time, the excitement there surpassed that on the Atlantic sea-board in 1849 when the stampede to California began. In three months in 1858 it was estimated that 23,000 men left San Francisco by sea and about 8,000 by land. These men, or some of them, brought plenty of money with them, as much as $2,000,000 in coin being deposited in the Hudson's Bay Company's safe at Victoria at one time. This was the only safe in the country, and the treasurer of the company refused to count the money offered to him as deposit. It was sealed up in bags by the owners, and when they wanted money their bags were handed to them, they took out what they needed and returned the bag to the safe.

An attempt was made by the Americans to make Whatcom, on Puget Sound, the point of departure for the mines, and much money was made and lost speculating in land there. But to reach the Fraser a road had to be cut through a dense forest almost tropical in its vegetation, and the natural current of the traffic remained with Victoria. Governor James Douglas refused to allow the American vessels to enter the Fraser, and as the steamer accommodation made available by the Hudson's Bay Co. was wholly inadequate to transport the thousands of men gathered at Victoria, they embarked in canoes, row-boats and make-shifts of their own construction. Hundreds of them were never heard of again, and are supposed to have been drowned. The mines worked at this time were all between Hope and Lytton, and anyone who has gone down the Fraser Valley in a railway train can picture in his mind's eye these indomitable men with shovel and pick on back climbing up and down the cliffs that border both sides of the river. Many of them were lost, some of them at Jackass Mountain falling a sheer thousand feet into the river.

At length a petty Indian war drove all the adventurers down to Yale, and it became evident that if supplies were to be taken to the forest a new route must be followed. The genius of Douglas solved the difficulty. There was known to be an Indian trail from the Harrison lakes to Lilloet. There were 500 miners in Victoria. Douglas proposed that in consideration of a deposit of $25 by each person accepting the terms and agreeing to work on the trail until it was finished the Hudson's Bay Company would transport him to the point of commencement on the Harrison river, feed him, and at the conclusion of the work furnish him with

supplies at Victoria prices or return the money if desired. The seventy miles of trail was satisfactorily built on these terms, the only difficulty arising having to do with supplies, the company contending that the supplies were to be delivered at Victoria prices at the lower end of the trail, while the miners insisted that the agreement was that they should receive them at the upper end. The matter was compromised by delivering them half-way, but the importance of the contention will be seen, and some idea of what freight-rates were at that time may be gained from the statement that beans were worth a cent and a half a pound in Victoria, five cents at Port Douglas, the lower end of the trail, and $1.00 a pound at the upper end.

Nearly all the provisions used on the Fraser beyond the canyon above Yale were brought in from the Columbia by traders from Fort Colville. Companies of 400 or 500 men accompanied by pack-trains started up the Columbia and by way of the Okanagan and Kamloops reached the scene of operations. One party of thirty-five started that year from Portland, Oregon, with nine teams of three or four yoke of oxen to the team, each wagon carrying about 3,000 pounds of provisions as freight.

The majority of the miners reached the Fraser at the season when the bars were covered with water, and a great many of them returned without making any farther attempt to attain the object of their long journey. Those who persevered and waited until the autumn and low water were richly rewarded for their patience. In October it was estimated that more than 10,000 miners were at work along the river.

In the meantime prospectors were working their way up the Fraser, and gold was found in many places, but it was not until 1860 that the richness of the Cariboo placer mines became known. The rush to that region made better roads necessary, and the next two years saw the completion of the Cariboo road extending from Yale to the mines. This was a tremendous undertaking, but a permanent wagon road was built which is in use to-day where it has not been superseded by the railway.

It would not be possible in one evening, nor would it prove interesting, to describe the whole country through which "The Southern Trail" runs, but scenery, soil and climate are so varied that no description of one part of the region traversed would serve for any other. My work in southern British Columbia has

covered several summers, but an account of an imaginary trip from Hope eastward to the Columbia seems the easiest way to describe the route and the country on either side of it. We shall imagine ourselves, then, with an outfit of pack-horses about to start from Hope. No guide is necessary for the ver est tyro in the woods could not lose the well-built, well-travelled trail we are to follow. The glory of Hope has departed, temporarily at least. A single store, a so-called hotel, and a few houses occupied chiefly by old-timers who have chosen this lovely spot in which to spend what remains of their lives, make up the white man's habitations. There is also a considerable half-breed settlement and near-by an Indian reserve. Travelling a mile or so along the rich alluvial flat which borders the Fraser, past orchards and gardens, the trail turns up the valley of the Coquihalla, Anderson's old route. The trail for fourteen miles to the summit, which separates the waters of this branch of the Coquihalla from the Skagit, is the most beautiful I have ever travelled over; built originally for a wagon-road it is wide and well made—a glorified "Lover's Walk." Between the Fraser valley and the summit it rises some 2,200 feet, but is nowhere very steep. Winding along the sides of the Coquihalla valley it crosses innumerable gorges and mountain torrents, plunging now and then into the dense forest to emerge again on the side of a ravine where a magnificent view across the Fraser to the north tempts one to loiter. Just after the summit is crossed and the waters of the Sumallow branch of the Skagit are reached good feed for horses is sufficient inducement to camp. Easily climbed mountains served to keep me there for two weeks last summer. They rise to an altitude of something over 7,000 feet on both sides of the valley and though very steep are easily climbed. Fish and game are plentiful, too, the small trout caught here having the finest flavour of any I have eaten in British Columbia. It may be said, however, that British Columbia trout cannot compare with those of the east either in firmness of flesh or delicacy of flavour. The common species, the "Rainbow Trout" and the "Dolly Varden" are very beautiful in appearance, as their names indicate, and they vary in quality in different streams, but at their best they are not so good as eastern fish, and in some streams they are soft and insipid. Like hares and blue grouse they make, however, a very agreeable change in ordinary camp diet when more palatable game is not to be had. Deer are very plentiful in the Skagit

valley, and we were very seldom on the high mountains without seeing them. Goats and bears are also abundant, but must generally be looked for. From the headwaters of this branch of the Skagit to Penticton, a distance of 55 miles the trail runs through ever-varying scenes of beauty, sometimes through the primeval forest, sometimes skirting the edge of a precipice, sometimes close to a stream. In many places the road is steep and tiring, but fresh views greet one at every turn, and the botanist visiting that region for the first time will find much to delight and interest him. The Skagit valley is the only known habitat in Canada of *Rhododendron Californicum*, the very finest of the rhododendrons in my opinion. Growing here in masses to a height of from 8 to 10 feet, its great clusters of bright pink flowers are sometimes as many inches in diameter, and walking among them one might easily imagine himself in one of the great public gardens of London or Paris. South of the trail, near the international boundary, are some of the finest mountains in Canada. Though few of them are more than 9,000 feet high, the general level of the country is little more than 1,000 feet above the sea so that in looking at them one sees between seven and eight thousand feet of mountain. The highest mountains along the C. P. Ry. exceed these in altitude, but their bases are four or five thousand feet above the sea. Great glaciers are found on their northern slopes, and alpine climbers in search of new mountains to conquer will find them in the Skagit valley. To reach the summit that divides the waters of the Skagit from those of the Similkameen one goes down one branch of the Skagit and up another, the two branches forming a wide V. This summit, where Anderson and those who followed him met with so many difficulties, is somewhat less than 6,000 feet above the sea and covered with snow the greater part of the year, the period when it is free varying of course according to the snow-fall of the previous winter. Crossed at any time after spring opens, flowers are seen on every bare spot up to within a few feet of the melting snow. Many of these alpine flowers are exceedingly beautiful and like our own spring flowers the same species are found everywhere. The two most beautiful and conspicuous species are an Anemone and an Erythronium, the latter of the same genus as our local Dog-toothed Violet or Adder's Tongue, but very much larger and commonly with several flowers on each spike. The Anemone, of the sub-genus *Pulsatilla*, resembles the so-called prairie crocus

but is creamy white in color and nearly two inches in diameter when fully expanded. The violets are represented by blue, yellow and white species, and our Claytonia or Spring-Beauty by a smaller species with larger flowers. Forty or fifty species may usually be collected on any mountain summit near snow, and as has been said, these spring flowers vary little, the same species being found everywhere.

The whole region traversed so far is a veritable sea of mountains, and if the scenery were broken up into small parcels there is enough of it for the whole of eastern Canada. Gold and silver have been found but not in paying quantities with transport facilities as they are now.

Crossing the summit, Whipsaw Creek is followed until it reaches the Similkameen, and a few miles further on, at the junction of the Similkameen and the Tulameen is Princeton, or Vermilion Forks as it was formerly called. Princeton is to be the great city of the interior of British Columbia according to those interested in the town-site and the mines of the vicinity, but its situation is somewhat too high for successful fruit growing, and the minerals are ch efly low grade. Coal and copper are the most important. The coal is soft, but will be valuable for smelting purposes and for use in furnaces and locomotives. Copper Mountain contains an immense amount of copper, but the ore is low-grade as is unfortunately the case with so much of the British Columbia ores. From Princeton to Midway, a distance of 105 miles, there is a fine wagon-road, and the "Northern Flyer" stage which makes the trip in 32 hours will carry the traveller through all kinds of climate in little more than a day with frequent opportunity to examine the soil and flora as the stage toils up steep hills. A little distance below Princeton is the western limit of the rattlesnake in this region.

About 20 miles below Princeton following the Similkameen is Hedley, a comparatively new mining camp, but one with great future prospects. The "Nickel Plate," the chief mine, is owned by Standard Oil men, and the properties included in their claims will continue to produce gold long after we are all dead as practically the whole mountain is made up of ore that will repay working. Within two or three years at the farthest, the Similkameen will be opened up by at least one railway, and with transport made easy the mines of the whole region will be developed. Up to the present all mining machinery has been brought in on wagons at

great expense, and none but the very richest ore has been touched. Hedley is about half way between Princeton and Keremeos. At the latter place, in early times a Hudson's Bay Company's post, an abundant supply of water has made irrigation of the dry flats possible, and all kinds of fruit and vegetables produce wonderful crops. Besides apples, cherries, plums and peaches, almonds are successfully cultivated. Before the water is turned on, the dry flats of the Similkameen valley are covered with sage-brush and cactus, and the soil is so hard that a loaded wagon driven over it makes no impression. When irrigated, anything can be grown, and three, or even four, crops of alfalfa are sometimes cut in one season. When I was there last year several thousand acres were being sub-divided into 10-acre plots which were being sold at $200 per acre. This seems a high price to pay for an acre of hard gravel and clay, but even higher prices are paid in the Okanagan district for similar land, and immense profits are being made there by those who have bearing orchards, their fruit being shipped to the northwest. The first railway to reach Keremeos will be one that will carry early fruit and vegetables to the mines of east and west Kootenay, where there is a constant demand at good prices.

A short day's journey to the east, Osoyoos Lake is reached. If the valley of the Similkameen is dry the region about Osoyoos Lake may be called a desert, at least it is the nearest approach to a desert we have in Canada. The heat during the summer is terrific and the soil, especially on the east side of the lake, is so sandy that it is almost without herbaceous vegetation. It is covered with clumps of *Artemisia* or sage-brush, *Bigelovia*—a yellow flowered composite shrub, and *Purshia*, the latter a shrub of the rose family with sweet-scented yellow flowers, in appearance and perfume much like the flowering currant. As might be expected, both the flora and fauna are characteristic of an arid region. An enumeration of the plants would not convey any idea of their appearance or peculiarities. Many of them have magnificent flowers, the finest of all being perhaps *Malvastrum Munroanum* of the mallow family. Its flowers are brick-red, quite unlike any other Canadian species except one of the same genus found on the dry prairies of the northwest. All the small mammals are peculiar to the region and several species of birds are found nowhere else in Canada. Around Osoyoos lake and between that lake and the Similkameen there are probably

more rattlesnakes than in all the rest of Canada. If the rattlesnake were as dangerous as it is supposed to be no one could live long in that region, but as a matter of fact the rattlesnake, like most other animals, will escape from man if he can, rather than attack him. Besides this, it is very easily seen in this open country, and unless one steps upon a rattlesnake unawares there is little danger, anywhere, of being bitten. As is well known due warning is given by the snake before it strikes, and as it neither springs at nor follows a passer-by, one may pass quite near them without danger of being bitten. When coiled for a strike a rattlesnake can reach about one-half its own length or at most two-thirds. And after all, only a small percentage of rattlesnake bites prove fatal. Much depends upon the season and the strength of the virus, but a good deal, too, on the condition of the person bitten. With all that can be said for it, however, no one willingly takes unnecessary risks, and the rattlesnake is more to be shunned than any other Canadian animal. No other venomous creatures are known for certain to inhabit the region, but the reports of the occurrence of a poisonous scorpion are so circumstantial that there seems little doubt that it is to be found there.

It is doubtful whether British Columbia will ever be a self-supporting province from an agricultural point of view, but as transport facilities are improved and mines, that cannot at present be worked profitably, are developed there will be a ready market at high prices for all that the soil will produce in the southern part of the province which I have attempted to describe. Any land to which water can be brought is wonderfully productive, but there is such a great extent of hilly or rolling country in the vicinity of level areas that are now being profitably worked that no one should purchase an acre of land in southern British Columbia without first seeing it or securing a guarantee from the vendor that a certain supply of water is available. I have recently read several prospectuses issued by land companies, and find that several of them are written in ambiguous terms as regards this important particular. The best advice to give a prospective investor in land, no matter where it may be located, is to see it before purchasing, but this applies with greater force to southern British Columbia than to any other part of Canada. A noteworthy example of what water will do in that hot region was observed at Osoyoos lake where water is pumped by a wind-mill to a settler's garden. The water is first pumped into a large

wooden tank, and what with leakage of one kind or another and overflow when the tank is full, the ground in its vicinity is kept saturated. The result is the rankest growth of vegetation I have ever seen, garden escapes and indigenous species being hardly recognizable as a result of the unwonted combination of heat and water, the whole teaching a lesson that the most unobservant man might profit by. A little consideration will explain the extraordinary growth that follows the irrigation of these dry places of the west. To begin with, heat and water are the chief requisites in plant growth, but these do not account for the wonderful results which have followed the irrigation of the dry soils of parts of British Columbia and the Northwest. In regions where the rainfall is heavy a constant leaching process is going on. The natural salts that reach the soil in rain, or through the decomposition of vegetable matter, are being constantly drained away; in a dry country this is not the case. What falls upon the ground stays there, and many of the apparently worthless soils are rich in all the constituents that go to make plant food. Long periods of irrigation will doubtless wash these away or enable the growing plants to assimilate them, and then artificial fertilization will be necessary. In the meantime water is the wonder-worker, and it seems to perform veritable miracles. The greater part of the country around Osoyoos lake and northward to lake Okanagan is owned by speculators who purchased thousands of acres from the British Columbia government at a nominal price. Cattle range over the hills, and here and there in the valleys where water is available settlers are located. Until last year there was little market for anything grown except cattle which could be driven east or west over the Dewdney trail or south into the United States. Construction work was begun on the Vancouver and Eastern railway last summer, and of course all kinds of produce sold at good prices. This is the railway owned by Hill, the charter for which provides that it may cross and recross the international boundary where it cannot be kept on our side without too great expense. This means of course that the new railway will follow the easiest route, which happens to be almost on the international boundary, between Osoyoos lake and Midway. The customs difficulties that it is feared this may give rise to are altogether imaginary. There are none but farmers and ranchers in that region on either side of the boundary, nor is there likely to be any one else after the railway is built. At

present there are few stores on Canadian territory, and settlers on the other side of the boundary go to and from the American side without hindrance. The stage-route does just as the railway will do—zig-zags from one country to the other, and there is never any trouble. Not much is heard now of the mines of the boundary country, and one unacquainted with the region might naturally imagine that very little was being done there, whereas, the truth is that in copper especially there has been a great increase in production every year since 1900. In that year the Boundary mines shipped less than 100,000 tons of copper ores, the annual shipments increasing until in 1905 the total had reached 928,000 tons. In 1900, 62,000 tons of ore were smelted at the boundary smelters, in 1905, 942,000 tons. The ore body at the Granby mine is so rich in gold and silver that experts say that no matter how low copper may go it can be produced from this mine at a profit. The shares of this mine and of many others in the Boundary country are held by capitalists, resident for the most part in the United States, and as these shares are all paid up, and are seldom offered for sale, the general public knows little of the value of the Boundary mines. The Granby mines alone are capitalized at $15,000,000, all of which is paid up. The possibilities of the Cobalt region are suggested by these figures, the probabilities, only the wisdom or foolishness of investors may guess at. As regards the timber of the region under consideration it may be said that there is everywhere an abundance for the needs of settlers, miners and railway construction, while the building of a railway that will tap the Skagit and Chilliwack valleys, will bring within reach forests that are only equalled by those in the immediate vicinity of the coast and on Vancouver Island. Fire is a constant menace to these forests, but here as elsewhere in Canada, the posting of the notices prepared by the Superintendent of Forestry has been the means of increased care being taken by all travellers, and the vigilance of the provincial fire-wardens and the prompt prosecutions of offenders is another great restraining influence. The recent establishment of forest reserves in the dry belt will insure both the wood and water supply of the future.

I cannot close without some reference to the work that has been done during the last six years by the surveyors and others working under the direction of Dr. King, the chief of the Boundary Surveys. These men have overcome what appeared to be in-

superable difficulties. Trails were cut through forests that seemed absolutely impenetrable, loaded pack-horses were taken up mountains that few but trained alpine climbers would attempt on foot, and the international boundary has been marked from the eastern slopes of the Rockies to the Pacific. Great as has been the difficulties that were to be overcome, the modesty of the men who had charge of the work has been such that few of them are known to the general public even by name It was so when the Northwest was first opened up, and there are few things of which Canada has greater cause to be proud than of the pains-taking, conscientious work of men whose only reward, for the most part, has been the satisfaction of having taken part in a good work well done.

The MacKenzie River Basin.

By E. Stewart, Supt. of Forestry.

[*Read Jan.* 11, 1907.]

Perhaps no portion of America has received greater attention from the explorer during the last three centuries than the sub-arctic regions of Canada, and yet they remain practically unexplored up to the present day.

As early as 1577 Martin Frobisher spent some time on the borders of the Arctic. The name of Frobisher recalls his contemporary, Drake, and carries us back to the defeat of the Spanish Armada in which he performed a distinguished part and for which he was honored by his king.

Later, about 1610, Henry Hudson sailed up the great river of the State of New York and also into that Canadian inland sea, which, along with the above river, bears his name. Hearne went down the Coppermine to the sea and wintered there in 1770 and 1771

To my mind the most distinguished of them all, Sir Alexander Mackenzie, made a journey in one short summer, that of 1789, from Lake Athabaska, then called the Lake of the Hills, down the Slave River, across Great Slave Lake, and then all the way down the great river which received his name over 1000 miles to the frozen ocean, returning the same season back to his starting point. He then ascended the Peace River 600 miles to a point near Dunvegan where he wintered. All of this in bark canoes, and much of it through an unknown region. The next season he ascended the Peace to its headwaters, crossed the Rocky Mountains, and finally, after enduring the greatest hardships, reached the Pacific, returning again by the same route to his post at Chipewyan.

Sir John Franklin in his second expedition, accompanied by Dr. Richardson, made the journey down the Mackenzie in 1825.

Many, whose names I need not recall, also imbued with a spirit of adventure, have from time to time journeyed along the ice-bound coast and through that sub-arctic wilderness which now

forms a part of the Dominion of Canada, and yet, except along certain traveled routes we to-day know very little of the country.

Any description of that vast region would be incomplete and almost impossible without frequent reference to the trading companies that have operated there for many years.

The first and oldest of these is the Hudson's Bay Co., which received a Royal Charter from Charles II in 1670. This company obtained great privileges over the country surrounding Hudson's Bay and the streams flowing into it.

In 1785 a great rival corporation was formed, viz., The North West Company. They had their headquarters at Montreal and were exceedingly enterprising. They not only established posts at various points on the great lakes of the St. Lawrence basin, but extended them into what the Hudson's Bay Co. regarded as territory belonging exclusively to them on the Red River and the Saskatchewan; and even went into regions far beyond where the older company had ever penetrated; even to the Pacific Sea on the one hand and the Arctic on the other. Sir Alexander Mackenzie was an officer of the North West Company. The presence of this new company in the waters tributary to Hudson's Bay soon resulted in conflicts between the employees of the two corporations, and this state of affairs continued till they were amalgamated in the year 1821.

The Hudson's Bay Co. brought their supplies from London to posts on the Hudson's Bay, from which points they were distributed, while the North West Co. brought theirs also from London but to Montreal, and from there every season transports in bark canoes were sent out with goods, which found their way, in some cases, even across the Rocky Mountains to the shores of the Pacific, and in others beyond the Arctic Circle to the north.

The area drained by the Mackenzie River is of vast extent covering as near as can be ascertained at present a territory of 451,400 square miles. Its principal tributaries flow from the west; they consist of the Athabaska, the Peace and the Liard, with many others of smaller size. The area of the St. Lawrence basin above Montreal, including of course all of our great lakes and the country tributary thereto, is only about 309,500 square miles, while that of the Saskatchewan and its two branches is only 159,000 square miles; so that the Mackenzie basin exceeds that of the St. Lawrence above the city of Montreal by over 140,000 square miles and is nearly three times as great in extent as the basin of the Saskatchewan and both of its great branches.

It was to make a journey down that great valley that I had set myself to accomplish, and knowing that this could best be done through the assistance of the Hudson's Bay Co., I applied to my friend Mr. Chipman, the Commissioner, from whom I had on previous occasions received many favors and soon was in possession of a letter to their agents, which had only to be presented to secure all the hospitality that could be given in a country where hospitality means so much.

I left Edmonton on the 2nd of June, 1906, at which point I engaged a team of horses, and in three days reached Athabaska Landing. In this journey we passed over the height of land dividing the waters flowing into the Arctic from those emptying into Hudson's Bay but the elevation is so slight that it is not noticeable till we are within sight of the Athabaska, where the descent is considerable.

The country passed over for the first 25 or 30 miles is similar to that about Edmonton, the soil being first class and largely prairie. After this it is for the most part second class with several miles of very light sand and timbered with Jack or Banksian pine.

The Athabaska at the Landing is from 60 to 80 rods wide, and at the time we saw it the water was of a yellow color containing a large percentage of mud. Later in the season it becomes clearer.

From this point I was to go with the first transport of the Hudson's Bay Co. carrying supplies to their northern posts. We found the steamer "Midnight Sun" at the Landing but had to wait three days till she was loaded. All being ready on the afternoon of the 8th of June she cut loose from the shore, was caught by the rapid current and with the whole village on the banks waving us bon voyage we were soon rushing down stream at about 12 miles an hour.

The steamer, in addition to her own load, towed six scows, each carrying about 10 tons. Most of these small scows are built at the Landing from rough spruce lumber sawn at the little sawmill there; they cost about $100.00 each and are seldom brought back, being usually broken up after reaching their destination and the lumber used for building purposes. The land rises in benches back from the river to the height of from 200 to 400 feet. It is generally wooded with poplar, spruce, birch, tamarac and willow where the fire has not destroyed it.

The land as we descend the stream appears rather light as

a rule though there are apparently considerable tracts of fairly good soil.

At a distance of 120 miles below Athabaska Landing we reach Pelican Rapids. At this point the Dominion Government in boring for oil a few years ago struck such a strong flow of gas that it interfered with further operations. The noise caused by the flow of gas which was on fire could be heard for upwards of a half mile distant. When first struck it could be heard a mile or more. This gas proceeds from a deposit of tar in the sand. The sands overlie the limestone and as we proceed down the river they are visible at the surface. The area of the country where these are found is of very large extent, embracing several hundreds or even thousands of square miles, and are most observable along the banks of the Athabaska in the neighbourhood of Fort McMurray.

According to a report made by Mr. R. G. McConnell of the Geological Survey, they are also seen on the Slave and Peace rivers as well as the Athabaska and through other sections of the MacKenzie River basin. In the same report an analysis by Mr. Hoffmann of a specimen collected some years ago by Dr. Bell gave by weight:—

Bitumen	12.42%
Water	5.85
Siliceous Sand	81.73

and a cubic foot of this bituminous sand rock would give 41.59 lbs. of bitumen. This report estimates the area covered by this tar sand at 1000 square miles, and the above analysis would give a bulk of 6.50 cubic miles of bitumen, and the amount of petroleum which must have issued from the underlying limestone would produce by weight 4,700,000,000, tons of bitumen.

This report also states that this tar sand evidences an upwelling of petroleum to the surface unequalled elsewhere in the world.

At the time of my visit a well was being put down near Fort McMurray with a hope of obtaining petroleum. It would seem very probable that this region will yet be an oil field of very large extent.

From Pelican Rapids our steamer had great difficulty in navigating the river for the next 45 miles to Grand Rapids. And from the latter point for a distance of 87 miles to Fort McMurray, the journey had to be made in small boats or scows. These were

heavily laden with the cargo from the steamer and about a week was occupied in making the journey. Numerous small rapids were encountered necessitating in some cases the unloading and reloading of the boats. Limestone rock takes the place of sand-stone along the banks, and in many cases the scenery is very picturesque. There is a good covering of soil, but in many cases it is too light for agricultural purposes. The timber is small and consists of poplar, birch and spruce, but about one-half the area has been recently burnt over.

The weather at the time of my journey here, which was made in the last week of June, was very hot, the mercury ranging between 85 and 90 degrees in the shade.

A short distance above Fort McMurray, there was observed what appeared the largest deposit of asphalt yet seen. It emitted a very distinct odour.

Fort McMurray, though not a post of very great importance at present, has a history of considerable interest. It was here that the weary traveller in the early days from far away Montreal, figuratively speaking, threw down his pack and gave a sigh of relief as he reached one of the great highways of the MacKenzie basin, after a journey by bark canoe, through a wilderness for the distance of 2,500 miles.

It was the first of July, the natal day of the Dominion that we arrived at Fort McMurray.

Upwards of twenty large boats and scows, with boatmen and passengers, numbering over a hundred in all, made a rather imposing appearance as we rowed and floated down the river on that bright and exceedingly hot morning. Every craft had some kind of a flag flying. in honor of the day, which made us feel that though we were beyond the borders of civilization and within the great North Wilderness, we were still in our own country and viewing our own possessions. About noon, on rounding a point, where the Clearwater joins the Athabaska, a welcome object met our sight, the Steamer Grahame, tied to the bank at McMurray.

We soon shook off the dust of travel and entered once more a civilized state of existence The Grahame is a large commodious boat, with comfortable state-rooms but the traveller is expected to furnish his own blankets.

On Steamer Grahame from Fort McMurray to Smith's Landing on the Slave River 287 Miles.

It was late in the afternoon of a very hot day, July 2nd, when we resumed our journey; and sitting on the deck I watched the picture before me; constantly changing in detail, and yet similar in character. The Clearwater mingling its contents reluctantly and slowly with that of the turbid Athabaska. Islands clothed with green spruce, recede from view as others appear in the distance. The sun declining, but so slowly that like the "Lotus Eaters," we could fancy it would always remain afternoon. Finally, however, it sank behind the hills, and then succeeded the almost equally and delightful twilight.

I took many photographs during the journey which serve better than words to convey an idea of the appearance of the country. But—there are two features that impressed me perhaps more than any others, and I wish that we could photograph them. They were these: the northern twilight and the silence that seemed to fall on the wilderness as the gathering shades increased, more and more till all nature was embraced in silent slumber. Frequently we tied up to the shore for the few dark hours that we had at this time, and in this latitude (later we had none) and this was the time and here the place for meditation, unless a somnolent disposition demanded other employment The dark sylvan solitude stretching out on every hand, and now wrapped in that lethean repose so akin to death as to be almost overwhelming in its intensity and impossible of description.

In the course of some twenty-four hours run there were evidences that we were approaching the mouth of the river. The stream had increased to double or treble the width it was above McMurray. The banks get low, willows begin to take the place of the poplar and the spruce. Islands on every hand seem to almost block the passage, then drowned land and great marshes stretch away to the horizon, and at last the waters of the "Lake of the Hills," now Lake Athabaska, are seen glistening to the east, while hills of red granite stretch far away along the shore, and at a distance of six or eight miles to the north, the white-washed buildings of Fort Chipewyan appear.

Another exceedingly hot day succeeded, the mercury even passing the hundred mark.

Again resuming our way, we soon pass out of the lake and enter the Slave River, which in a few hours receives a mighty river from the west, the Peace, which rising in the Rocky Mountains flows in an easterly direction, nearly 800 miles to swell the volume of the great water system of our far north. This accession renders the Slave below this point one of the great rivers of Canada. It now varies from a half mile to a mile or more in width. Islands become frequent and the current greatly increases.

Owing to a series of rapids between Smith's Landing and Fort Smith, a distance of 16 miles, steamers go no farther down than the former place.

The goods are transported by waggons over this portage.

At Smith we found the Wrigley, another steamer awaiting us.

On Steamer Wrigley from Fort Smith to Fort McPherson, 1299 Miles.

The "Midnight Sun" and the "Grahame" were flat bottomed crafts, driven by large stern-wheels, and drew only about two feet of water, but the Wrigley was of a different type, being built like one of our lake boats, propelled by a screw-wheel and drawing five and a half feet of water, and the whole course of our journey from this point to Fort McPherson was made by her without interruption.

It is unnecessary to give a detailed description of the river or the country immediately below Fort Smith, as it is similar in appearance to that farther up the river, and also to that of the Athabaska. As we approach the mouth the usual conditions follow. The land falls away into swamp, willows again take the place of the spruce and poplar, islands are numerous, and after many devious courses between them, we behold, at last, the waters of Great Slave Lake.

The spring freshets had caught us at Fort McMurray, and all the way down from there, the water carried a very large percentage of alluvial soil, and resembled in appearance the historic "Yellow Tiber," borne swiftly along on its surface also, were trees that had withstood the storms and floods of a century along the banks of the Athabaska, the Peace, and hundreds of tributary streams all the way to the base of the Rocky Mountains. These annual floods have left along the shores and on the sandbars of the Slave River millions of feet of timber, sufficiently large for lumber.

As the waters widen out near the lake, the current decreases the soil held in solution while the flow was rapid, now obeys the law of gravitation, and islands innumerable have been formed, while others in embryo exist in the sand-bars for long distances in the neighborhood of the channel. It was difficult to follow the outlet to deep water, and we grounded several times after we thought we were well into the lake. However, by appliances peculiar to such navigation, we finally got into deep water, and an hour's run brought us to a fine bay, on which we beheld another white-washed village with a hundred or more Indian lodges in the foreground. This was Fort Resolution, and the lodges were the temporary habitations of the Chipewyan and Slavey Indians, who were assembled here for payment of treaty as they call it.

It was late in the afternoon when we entered the lake; we lost two or three hours on the sand-bars, and another in putting on wood, so that when we went ashore at Resolution it was near eleven o'clock at night. I remember thinking that we would have to make our journey short, so as to get back before dark; but what with a visit to the tent of Indian Commissioner Conroy and Dr. West, and the exchange of information from "outside" which we possessed, for that of the interior which they could furnish, and with a visit to the Indian camps, I was astonished to find that we had gone from one day into another without having experienced any intervening night between them. A dull twilight was giving way to a bright dawn, as we went aboard our ship. This was the beginning of constant daylight, that remained with us for several weeks.

I noticed in the gardens at Fort Resolution, potatoes, turnips, beets, peas, cabbage, etc. The potatoes were particularly good, and so far advanced that by August the first they would certainly be fit for use.

We had before us a large sheet of open water of over 100 miles to traverse. This would not be difficult were it not for the heavily laden scows that we were towing. Leaving Fort Resolution at about 2 o'clock on the morning of July 14th, we soon had to seek shelter under an island and wait for the sea to subside, which it did sufficiently to allow us to start again about 4 p.m., but for several hours it seemed doubtful if one of the boats, which was leaking badly, could be kept afloat till we obtained shelter at Hay river, and we were all glad to find when we arose the next morning, that the hard work of the crew of the leaky craft, had

been rewarded for their toil. She was among the other boats lying along the bank at Hay river mission, and without showing much damage either to the scow itself or to the cargo. The latter is much the more important as it contains supplies brought for such long distances, and at such great expense, and besides there are anxious men, women and children whose very existence depends on its reaching them in good condition. At this point the Rev. Mr. Marsh, of the Anglican Church, has established a very prosperous mission and school.

Awaking early in the morning, and before the crew or the inhabitants of the place had risen, I walked up the river and found a sandy beach, and was soon enjoying a bath. While engaged in this luxury, I noticed that I had attracted the attention of a half a dozen rather large sized and very hungry looking, Husky dogs, which came rushing down the bank barking furiously, and evidently thinking me a legitimate object of prey. In the whole course of my journey, this is the only instance where I was the subject of attack of any kind, and I must confess I felt greatly alarmed, as I realized my situation, and cannot help thinking that had it not been for some Indians suddenly appearing in a canoe around a point in the river who paddled quickly to my rescue, the consequences might have been serious. They probably thought I was some animal trying to escape them by swimming the river.

The morning was fine. The wind had subsided, and the great lake, which serves as a settling basin for the turbid waters entering it from the Slave river, was here as clear as that of the St. Lawrence. A few hours run brought us to a bay with many islands, which gradually contracted to a width of two or three miles, and we now realized from the current that we had entered the great river, into which all the waters that we have traversed flow. No more delays are now anticipated, no lakes to cross, no rapids to encounter, and no darkness to delay us on our course for the rest of the journey of a thousand miles to Fort McPherson.

The blowing of the whistle of the Wrigley early on the morning of the 15th of July, announced that we were approaching Fort Providence, and as the boat rounded an island in the river exclamations of astonishment were heard on every hand. There on the right bank of the river lay a village, for all the world like some of those along the St. Lawrence. The church, with bells ringing out a call to the Sunday morning service, the convent hard by with the Indian pupils in their pretty costumes accompanied by

their teachers, the sisters of the mission, all lining the bank to welcome the founder of the school, Sister Ward, from Montreal, who accompanied us this far. This devoted woman first went into that country forty years ago, where she was instrumental in organizing several schools during a residence there of over thirty years; and was at this time making a visit of inspection to them, intending to return before the season closed, to the home of her novitiate, the Convent of the Grey Nuns of Montreal.

A few words may be appropriate here regarding the character and appearance of the country, as we view it from this point. I have mentioned, that the appearance of Fort Providence was suggestive of the parish villages along the St. Lawrence. The river, too, both in its size and clearness of the water, which lasts till we reach the junction of the Liard, the appearance of the banks and the hills beyond are so like what we behold on the lower St. Lawrence, that we could almost fancy we were making a journey between Montreal and Quebec. Another surprise awaits us in the character of the soil, which is a rich alluvial deposit, very similar in quality and appearance to that in the fertile belt of our prairie provinces.

I am now referring to the land along the river I had not an opportunity of making any exploration inland. It may be that much of the country is covered with muskeg, but notwithstanding this, I am disposed to think that there are considerable areas adapted for agriculture along the Mackenzie between Great Slave lake and Fort Simpson.

In the garden of the mission at Fort Providence, at the time of our visit, namely, July 15, were found:—potatoes in flower, peas fit for use, tomatoes, rhubarb, beats, cabbage, onions, etc., while of fruits, were red currants, gooseberries, raspberries, saskatoons and ripe strawberries, and more important still hard by was a small field of wheat. The latter, I understood was sown on the twentieth of May and at this date, less than two months after, it was not only headed out, but the grain was fully formed and was in the milk. I learned, subsequently, that on the return of the steamer on the 28th of this month, the grain had been cut. This exceedingly rapid growth seems incredible, and can only be accounted for by the almost constant sunlight and heat, which the latitude of the place affords. This coupled with the moisture, from the frost, deep down in the soil, forces growth with hot-house rapidity.

A run of 161 miles brings us to Fort Simpson. It is prettily situated on the left bank of the Mackenzie, just below the mouth of the Liard. The water of the latter is muddy, and for miles below the junction, the clear waters of the larger stream refuse to mingle with those of its tributary. Finally, however, they are united, and from here on the waters of the great river resemble no longer those of the St. Lawrence, but rather of the Saskatchewan and the Mississipi. It is one of the characteristics of those western rivers that they have no lake expansions, which would serve as settling basins and render the water clear. The Athabaska has none, neither has the Peace or the Liard, nor either of the Saskatchewans, or the Missouri, or the Mississippi, and the consequence is that in each case the water is muddy.

Fort Simpson in Lat. 61° 52′ N, though it has lost some of its importance in recent years may still be regarded as the emporium of the Hudson's Bay Company for the Mackenzie District. It was here that the supplies were distributed, not only for the outlying posts farther down the river, but also for those up the Liard, and to numerous inland stations. From here too the Coureur Du Bois or "trippers," were sent out in winter to the Indian hunting grounds carrying with them by dog trains ammunition and blankets, and bringing back the furs of the country. It is the last point we visit as we go north that contains certain of the vestiges of modern civilized life. The village can boast of a system of electric lighting, a needless luxury for a considerable part of the year when there is no darkness, but later when the sun declines so low in the heavens as to almost refuse to dispel the darkness, it serves to somewhat lessen the gloom of the winter night. It also possesses a museum containing stuffed specimens of the animals and birds of the arctic and sub-arctic forest. In the factor's residence is also to be seen a billiard table, and other articles nowhere else found in the country. A saw-mill cuts timber for home use from spruce trees growing in the vicinity.

Wheat is sometimes grown in a primitive way for home use, probably the most northerly point that it has ever ripened in America. We are now nine hundred miles north of the international boundary, and though I do not desire to seem too optimistic, it is certainly some encouragement to those who have sanguine hopes of our country's future to know that the fertile soil of the Mackenzie valley, at least this far north, is not rendered unproductive owing to the high latitude.

We left Fort Simpson at 5 a.m. on July 17th, and in four hours caught first sight of the Rocky Mountains. The snow-clad peaks of the Nahanni Range, which attain a height of about 5000 feet above sea level, served to break the monotony of the comparatively level landscape through which we had travelled for the past six weeks.

The weather had continued very hot, with only an exception of a day or two, from our start, but whether from the effect of the mountains or not, we experienced a very decided change in the temperature immediately we reached their vicinity, and from this on we suffered no more from the excessive heat, which had been as unpleasant as it was unexpected. We had counted on escaping the usual July heat, but so far it had really been more oppressive and certainly more constant, extending right through the long twenty-four hour day, than I had ever before experienced.

It strikes the observer as extraordinary that the Mackenzie in its way to the sea from Great Slave lake should bear off to the west, so far as to necessitate its cutting its way between two ranges of the Rocky Mountains, where a much shorter course and apparently one through a more level country lay open to the east into Coronation Gulf.

At the dis ance of 136 miles below Simpson, we reach Fort Wrigley. This is a new post; the old one of the same name twenty-five miles above having been abandoned owing to its unhealthy locality. The country about Fort Wrigley is fairly well wooded. I noticed a spruce log, cut in the vicinity which measured twenty inches in diameter.

The Nahanni river, which is a considerable stream, flows from the west and joins the Mackenzie about half-way between Simpson and Wrigley. Just north of it rises Mount Camsell, a snow-clad peak 5,000 feet high.

Below Wrigley the river narrows to from a half to three quarters of a mile in width. This continues for some distance and then widens out as we proceed down the stream. Two noted mountain peaks known as Mount Bompas and Mount Wrigley are seen between Wrigley and Norman. About twenty miles above Fort Norman and on the left side of the river the clay banks assume a very red appearance and the people use the earth as paint. This condition of the earth has been produced by fire in the coal seams. For several miles along the route the fire is now apparently extinct, but as we reach a point eight miles above Fort

Norman for upwards of two miles along the right bank of the river smoke is distinctly observed from fires still burning far down in seams of coal.

It is worthy of note that Sir Alexander Mackenzie makes mention of these fires in his narrative as existing in 1789 when he explored and gave his name to the river

About sixty miles below Wrigley we pass the mouth of Salt river which flows from the east. It is so named from deposits of salt that exist some miles above the mouth. Rock salt is said to exist on the Great Bear river above Norman.

At 7 p.m., July 18th, we reached Fort Norman at the mouth of the Great Bear River which is the outlet of Great Bear Lake. Fort Norman is distant from Fort Wrigley 184 miles and 1398 miles from Athabaska Landing. Its situation is very picturesque. The mountain peaks stand up in bold relief out of a vast level plain. Bear Mountain on the north side of Great Bear River and east of the Mackenzie is the most conspicuous.

It was 11.30 p.m. when we left Fort Norman, but there was no darkness, only a subdued light such as we have in more southern latitudes shortly after sunset. The steamer ran all night and on rising on the morning of the 19th we were over half way between our last port and Fort Good Hope. Between Norman and Good Hope we have mountains on both sides of the river, and as we approach the latter and at about six miles above the Fort we enter the "upper ramparts of the Mackenzie." The great river is here contracted for some four miles to a width of about a quarter of a mile. On each side rise perpendicular walls of limestone rock to a height of from 100 to 500 feet which resemble huge fortifications. The river is here very deep and a mile or two below the ramparts where it takes a sharp turn to the left Fort Good Hope appears in view like another Gibraltar.

At 3.30 p.m. we reached Fort Good Hope 174 miles below Fort Norman, 1572 from Athabaska Landing and only 26 south of the Arctic Circle. Its situation on a level plateau is charming. The banks are about thirty feet high and the soil is similar to that all along the river, being a rich deposit very much resembling the soil of our great prairies. I saw potatoes in flower, cabbages, onions, beats, etc., in the gardens, and on an island nearby very good spruce timber which is cut into lumber by whip-saws.

The steamer left Good Hope at 1 a.m., July 20th, and when we arose in the morning we found we had passed the Arctic Circle

hours before. The banks of the river are getting lower, the river widens, and we are fast drifting down towards the Arctic Sea.

Some time in the evening we stopped at Arctic Red River Post at the mouth of a stream of the same name. It struck me as the least desirable place to live in of any in all this northland. A few houses, the church, and the graveyard are all crowded on the side of a hill. Perpetual frost is only a foot below the surface and we no longer see that emblem of civilized life, the vegetable and flower garden that has gone so far to make many of those lonely posts seem somewhat cheerful. We only stopped an hour or two at this post and then started for our last and the most northerly post in the country, Fort McPherson.

About 1.30 a.m., July 21st, I rose as we were rounding Point Separation, so named from the parting here of Sir John Franklin and Dr. Richardson when they separated for their perilous trip around the shores of the frozen ocean.

The sun was just skirting the northern horizon and I endeavoured to take a photo of it which I am afraid was a failure. Point Separation lies between the junction of the Mackenzie and Peel Rivers. Below this point is the delta of the Mackenzie which is many miles in width, with numerous islands between here and the sea which is some 80 miles distant. At the point where Franklin and Richardson were camped are two spruce trees which were marked as lobsticks at the time of their separation and in commemoration of that event. Both are still standing, though one of them is dead. Judging from their appearance at a distance I would say that they are each about sixteen inches in diameter and seventy feet in height, and this nearly 100 miles beyond the Arctic Circle. I have been very much interested in the tenacity of life as shown in the growth of trees under the adverse conditions prevailing in this north country. Since crossing the Arctic Circle we have seen no vegetables but trees such as the spruce, birch, tamarac and willows are seen all the way, and as we round Point Separation and ascend Peel river spruce lines the banks. It attains a size of twelve to sixteen inches and is used at Fort McPherson not only for their log buildings but also is whipsawed into lumber for general use.

After entering the Peel river the steamer stopped to take on wood which delayed us a couple of hours, but very soon after starting we beheld on the high banks of the east side of the river the houses of Fort McPherson with the white tents or tupics of the

Esquimaux on the beach below. These Esquimaux had come over in their whale boats from Herschel island in the Arctic sea to meet the Wrigley. Their complexion is almost white with a dash of ruddy colour that indicates good health. They seem very cheerful, are not at all diffident or stoical like many of our Indian tribes. On the contrary they are very inquisitive and disposed to make themselves almost too familiar. They are of fair stature and do not show any of the marks of the struggle for existence that is observable in their neighbors, the Indians, in this part of the country.

At Fort McPherson, as at all the points visited for the last 1300 miles of our journey, no news from the outside world had been received since the last winter mail in March. For over four months the news received was purely local and generally consisted of reports from a few posts in the surrounding country, from hunting parties returning from their winter quarters, and from the whalers entrapped by the ice in the sea at Herschel island. We were the first to inform them of the eruption of Mount Vesuvius and the San Francisco earthquake, both of which had happened months before. Another message was one of sadness to all in this district. It was the death of Bishop Bompas who was well known and evidently highly esteemed by all.

A few words regarding Fort McPherson may be of interest. It is, as before stated, the most northerly of the Hudson's Bay Company's posts. Its latitude is 67° 25′ and it is truly an Arctic village. The sun never sets for about six weeks in summer and is constantly below the horizon for the same time in winter. The thermometer went as low as 68° below zero (Fahrenheit) last winter.

The inhabitants are in close touch with the Esquimaux of the Arctic sea and with the whaling ships that annually visit these waters. These whalers are mostly from San Francisco, coming up through Behring's strait in the summer and returning again in the early fall. Last season, 1905 and 1906, most of them were entrapped by the ice that blocked the straits and were compelled to remain there for the winter. They went into winter quarters at Herschel island where there is a detachment of the Royal North West Mounted Police. They were not sufficiently supplied with provisions for this emergency and had to rely largely on what could be obtained in the country. They engaged the Indians of the mainland to supply them with meat from the chase, principally moose, with the result that the shipment of fur this year from the post at McPherson was very much smaller than usual.

The report by the whalers of the ice conditions of the summer of 1905 is of interest to Arctic navigators. They say that the ice that drove into Behring's sea from the north-east and prevented their exit left that part of the ocean almost free of ice, a very unusual thing; and one of the captains is reported to have said that he was strongly tempted to set sail for the pole, as in his experience of twenty or twenty-five years he had never seen what seemed so good an opportunity of winning fame by such a venture. But he said his commission was to capture whales and not the pole. That these reports are correct is borne out by the fact that Captain Amunsden who was exploring along the north-east coast finding open water to the west set sail in that direction, and to his surprise soon found himself in the company of these whalers near the mouth of the Mackenzie. He was compelled to go into winter quarters and laid up with them at Herschel island till this summer when he succeeded in getting out through Behring's strait, being the first to make the entire North-west passage. During last winter he made an overland journey out to the Yukon and returned again to his ship the Gjoa.

The Wrigley remained at McPherson only long enough to unload the supplies for this post and to put aboard the furs that had been secured during the year and then left on her long journey up stream. She makes but the one trip to this point each year and is the only steamer that goes so far north.

At 12 o'clock at night she blew the whistle and soon left the village to resume its usual life for another year. As I walked across the sand-bar and climbed the bank, the northern sky was aglow with the midnight sun only a few degrees below the horizon.

The Indian boys were playing football, while the older members of the community went back to their homes and talked over the news so recently received. Standing on the high bank of the river with the outline of the steamer receding from view, I could not but reflect on the great expanse of country between here and the settled parts of Canada. Away across two thousand miles of forest, lake and prairie, I could see in imagination all the settlements we have yet made along the southern border; a mere fringe of our vast possessions.

But the question that the practical man will ask is, "Will it ever be worth anything?" In answer to this it might be said that it is already worth something for the furs it produces.

I have not statistics at hand, but when we look at any assem-

bly in winter and see the costly furs that are now worn, most of them the products of our northern forests, we cannot but be impressed with the value thus represented, and there is one point to which I would ask attention and it is this: that the uncultivable public domain should be devoted to the production of timber and the conserving of the fish and game of the country. The forest reserves may be made game preserves, where, by judicious care, the present annual product may not only be maintained but greatly increased.

But there are other resources. I have already referred to the soil and the products thereof at present growing far beyond the limits of regular settlement. I have also noticed the timber extending along our route almost to the frozen ocean. If nothing else we have in the Arctic slope a world's supply of pulp-wood. We have in the cool waters of the North excellent fish in vast quantities, and lastly, we know enough of the presence of minerals of various kinds to almost warrant the belief that there are other Klondikes and Cobalts in those unfrequented and unexplored regions.

Interesting as are the natural characteristics of the country and its undeveloped resources the inhabitants who make their home there are at least worthy of greater attention. In the region traversed between Edmonton and Fort Yukon we meet with several tribes of Indians speaking as many different tongues. The first of these as we go north is the Crees, the Knisteneaux of Mackenzie. Then, as we reach Athabaska lake we have the Chipewyans; next the Slaves, and lastly the Loucheux. The Cree, the Chipewyan and the Slave, though differing much in speech resemble each other in character and appearance; but when we come to the Loucheux we seem to have reached a different type and one more closely allied to the eastern Asiatic than to the American Indian. They inhabit the country of the lower Mackenzie down to the sea and west along the Porcupine and lower Yukon. They are rather short in stature and dark in colour, are very inquisitive and seem much disposed to imitate the white man. They are very devout in their religious observances, most of them being members of either the Anglican or Roman Catholic Church.

Any narrative of travel would be most incomplete that did not make reference to the missions of these two churches in the far north. At Chipewyan, Providence and Good Hope, the

Roman Catholics have fine buildings and large schools, as well as at other points, while the English Church has established itself at most of the points. They also have schools at Fort Simpson, at Hay river, and I believe also at several of their other missions.

The Indian, the halfbreed, the white trader and his employees, and the missionaries constitute the very scattered population of that vast region between the borders of civilization on the south and the Arctic sea on the north. To endure the rigorous climate, the isolation from civilized life with starvation constantly to be feared and the many deprivations incidental to the wilderness, one would think should have its compensations somewhere, but it must be said that they are not apparent to the ordinary observer. Such a life undoubtedly has some enjoyment for the young, active and vigorous, but for the afflicted and the aged the case is very sad.

At very many of the points visited we were implored for advice and for medicine by the sick. Many having chronic diseases which simple surgical treatment would cure are compelled to live out a shortened existence, for no physician except by merest chance ever visits them. The Department of Indian Affairs has physicians who attend to the medical wants of those Indians that are under treaty, but throughout the whole valley of the Mackenzie river from Great Slave lake to the sea, nearly a thousand miles, being outside of treaty limits, there is no physician to be had. Surely the people of this country would endorse any action that the Government might take for the relief of the afflicted there, and it has occurred to me that the establishment of a small hospital at Fort Simpson is something that would appeal to the charitably disposed among us if the need of it were only known.

MACHIAVELLI.

By J. S. Ewart, K.C.

Read Jan. 25, 1907.

Will you be kind enough to fix in your minds the date A.D. 1500. It is a round figure and easily remembered. It is just a millenium and a half after the birth of the greatest teacher of morality the world has ever seen—a millenium and a half (of progress shall I say) from Christ of Bethlehem to Nicola Machiavelli of Florence (now thirty-one years of age)—from the greatest ethical teacher, to one whose name connotes, usually, nothing but diabolical depravity.

1500 years before Christ we had Moses and a religion crude, tribal, and anthropomorphic. From that time up—upon the whole up—through Judges and Kings and Prophets until Jesus, who swept away the old law, with its rituals, and sacrifices, and feast days, and established personal purity, and charity, and love, as the religion of the elite of all future ages. And 1500 years after Christ, we have Machiavelli, whose name is now unconsciously referred to when we say "Old Nick," for people in aspersing the devil could think of no harder title for him than the Christian name of Machiavelli.

General Execration.—It is difficult, now that we have forgotten him, or possibly got used to his methods (we shall see), to over-estimate the horror with which the great Florentine was for many years regarded. No scholar and teacher was ever so execrated as was Machiavelli. Macaulay doubts "whether any name in literary history be so generally odious as his."

Reasons for Execration.—The reason for all this detestation is to be found in Machiavelli's two books, "The Prince" and "The Discourses upon Livy," more particularly the Prince, and especially the celebrated 18th chapter of that work. The heading of the chapter is "How far a Prince is obliged by his promise"; but Diederot's substitute, "The circumstances under which it is

right for a Prince to be a Scoundrel" has been thought to be an improvement upon the original caption. Let us hear the substance of it:

"How honourable it is for a prince to keep his word, and act rather with integrity than collusion, I suppose everybody understands; nevertheless, experience has shown in our times that those princes who have not pinned themselves up to that punctuality and preciseness have done great things, and by their cunning and subtility not only circumvented and darted the brains of those with whom they had to deal, but have overcome and been too hard for those who have been so superstitiously exact. For further explanation you must understand there are two ways of contending: by law and by force; the first is proper to men; the second to beasts; but because many times the first is insufficient recourse must be had to the second. It belongs, therefore, to a prince to understand both, when to make use of the rational and when of the brutal way; * * * * A prince, therefore, who is wise and prudent, cannot or ought not to keep his parole, when the keeping of it is to his prejudice, and the cause for which he promised removed. Were men all good, this doctrine was not to be taught, but because they are wicked and not likely to be punctual with you, you are not obliged to any such strictness with them; nor was there ever any prince that wanted lawful pretence to justify his breach of promise. * * * * Nevertheless, it is of great consequence to disguise your inclination, and to play the hypocrite well; and men are so simple in their temper and so submissive to their present necessities, that he that is neat and cleanly in his collusions shall never want people to practise them upon. * * *

"A prince therefore, is not obliged to have all the forementioned good qualities in reality, but it is necessary he have them in appearance; nay, I will be bold to affirm that, having them actually, and employing them upon all occasions, they are extremely prejudicial; whereas, having them only in appearance, they turn to better account. It is honourable to seem mild and merciful, and courteous, and religious, and sincere, and indeed to be so, provided your mind be so rectified and prepared that you can act quite contrary upon occasion. * * * It is convenient his mind be at his command, and flexible to all puffs and variations of fortune, not forbearing to be good whilst it is in his choice, but knowing how to be evil when there is a necessity. A prince, then,

is to have particular care that nothing falls from his mouth but what is full of the five qualities aforesaid, and that to see and to hear him he appears all goodness, integrity, humanity, and religion, which last he ought to pretend to more than ordinarily, because more men do judge by the eye than by the touch; for everybody sees, but few understand; everybody sees how you appear, but few know what in reality you are. * * * Let a prince, therefore, do what he can to preserve his life, and continue his supremacy, the means which he uses shall be thought honourable, and be commended by everybody. * * * There is a prince at this time in being (but his name I shall conceal) who has nothing in his mouth but fidelity and peace; and yet had he exercised either the one or the other, they had robbed him before this both of his power and reputation."

Probably you now agree that no human name could better fit the Father of Lies than that of Nicola; that Machiavelli must at all events be regarded as the champion amongst the mundanes; and that possibly he may be able fairly to hold his own in the realms below, where he no doubt at present sojourns.

Not too Fast.—It may be, however, that we are going a little too fast. Let us investigate a little further. Let us try to understand the conditions which surrounded young Nick (as we may call him) and the objects which he had in view. Above all let us know something more of the man himself and try to estimate him, not by reading the 18th chapter alone but by his environment and his general character.

A. D. 1500.—The Middle Ages are over. They did not close precisely with the celerity of a rat-trap, but if you want a date put it at 1453 when the Mohammedans took Constantinople and ended the Eastern Roman Empire.

Every period is rightly said to be one of transition, but to no century in history can the word be more properly applied than to the one just past by.

In the first place it is the period of transition from feudalism to nationalism; from the baron to the King. And not without much fighting and fraud, violence and intrigue, is the castle at last to be dominated by the crown.

It is the period in which the preponderating influence of the Holy Roman Empire, and of the Holy Roman Church, are very clearly declining—in which the heretofore dominating idea of unity (as there is but one God, so there must be but one sovereign

of one universal empire, and one Pope of one universal church) is giving place to the opposing idea of separate nationalistic aggregations.

It is the period of discovery and invention—the Copernican astronomy; the compass; the discovery of America; the passage round the Cape; paper and printing; better use of gunpowder; and the explosion of many very absurd notions.

It is the period of the Italian Renaissance, that wonderful (many people yet think sinful) revolt against ecclesiasticism and thought-bondage; that extraordinary assertion of the dignity and freedom of the individual intellect; that surprising recrudescence of art, and learning, and all the humanities—the renaissance has already commenced its labors, and the mind of man is once more a seething furnace, from which are thrown off fierce thoughts for good and for evil.

It is the period of the entrance of the Mohammedan power at the eastern end of Europe; and its expulsion at the western end (Granada having fallen before Ferdinand and Isabella in 1491). Henceforth the Turk is to be reckoned with in Italian and other politics.

It is the period of fighting and embroglios everywhere, Louis XII of France at the time of our central date has entered the European melee with much energy; and has busied himself (and everybody else) with his alliances, and treaties, and wars—inglorious and disastrous wars, aiming sometimes consciously at supremacy, but frequently unconsciously at what afterwards became known as the balance of power.

Ferdinand and Isabella have united Spain. Their soldiers are the best in the world, and are given plenty of employment.

Germany is as yet but a loose aggregation of petty states, Prescott describes its conditions:

"From the accession of Rudolph of Hapsburg to the reign of Maximillian * * * * the empire felt every calamity which a state must endure. * * * * The causes of dissension among the vast number of members which composed the Germanic body, were infinite and unavoidable. These gave rise to private wars which were carried on with all the violence that usually accompanies resentment when unrestrained by superior authority. Rapine, outrage, exactions, became universal. Commerce was interrupted, industry suspended, and every part of Germany resembled a country which an enemy had plundered and left desolate."

And now what of Italy in A.D. 1500? With troubles of all sorts everywhere else, what are the circumstances in the more immediate vicinity of Florence?

Central Italy.—On the throne of Peter has been seated for eight years one of the worst of the Popes, Alex. VI (1492–1503)—"memorable," says the Encyclopedia Brit., "as the most characteristic incarnation of the secular spirit of the papacy of the 15th century." Undoubtedly a great man, his ambition was largely for his family and the temporal interests of the church. For these purposes he undertook the displacement of the petty nobility, among whom were parcelled out the States of the Church and who left to him "hardly the shadow of dominion" (a), an enterprise which in the hands of his son, the notorious Cæsar Borgia, developed into the possibility of Cæsar being proclaimed King of the Romagna.

This Cæsar Borgia may almost be regarded as the then living exemplar of Machiavellian political morality, save that he applied it not for State benefit but for personal ambition. Made a Cardinal at the age of seventeen, he found in the church too narrow a scope for his activities and great abilities. Resigning it for his soul's health, he entered with zest into the prevailing struggle for personal power and territorial aggrandizement. Aided by the influence of his father the Pope; unrestrained by the least semblance of morality; undeterred by the enormity of any crime which seemed to be necessary for his advancement; using craft and kindness; assassination and largesse, he had almost reached the summit of his ambition when his father died and was succeeded by the hereditary enemy of his house, Julius II (1503–1513) who speedily reduced Cæsar from would-be King to a place in the prison of St. Angelo. He was killed in 1507.

Meanwhile Julius by dexterous reconciliation between the two powerful houses of Orsini and Colonna, by diplomatic arrangements with France and Germany, and finally by force where diplomacy failed, succeeded in completing the work of Alexander, and in consolidating the temporal power of the Pope in the Romagna. All this was going on in Central Italy.

Northern Italy.—Raised now to secular power Julius

"Whose ambition was superior, and his abilities equal, to those of any Pontiff who (*b*) ever sat on the Papal throne,"

(*a*) Prescott: "History of Charles V," Vol. 1, p. 97.
(*b*) Prescott: History Charles V, Vol. 1, p. 90.

formed the famous league of Cambrai (Louis XII, Emperor Maximillian, and Ferdinand of Spain) against Venice, with a view to dispoilment of her territories. Quarrelling next with France, he combined various powers in the Holy League (Ferdinand and Venice, and afterwards England, and the Emperor Maximillian) against her. The French were driven across the Alps (1512); but Julius although he had secured the Papal States had to forego his ultimate aim of expelling all foreign powers from Italy. There was not much rest for Northern Italy during the time of Julius.

The Feudal system had never in the northern part of Italy established its rocky castles, and its pastoral and agricultural entourage. There the city-states, patterned on great Rome, maintained their ascendancy; and Venice, Florence, Pisa, Genoa, Milan, Parma, Modena and other places, divided amongst them the country parts and the less important towns and villages. These cities were for the most part Republics, and their history is almost confined to forming alliances one with another; breaking them and making new combinations; eternal fightings and diplomacies. Northern Italy was seldom at peace and when she was "the principal employment of her Princes" as Machiavelli tells us "was to watch each other and strengthen their own influence by new alliances, leagues or friendships" (*a*).

These cities were for the most part dominated by wealthy and powerful families, whose factious rivalries and hatreds were eternal sources of discord, revolution and assassination. The Medici were the most prominent in Florence. Foreign fightings and domestic broils were in Machiavelli's day the constant occupation of the Florentines.

Southern Italy.—All south of Rome, and the Island of Sicily (known as the Two Sicilies) had boasted a King of its own—the King of Naples. But Charles VIII of France, six years prior to our central date, claiming title as Duke of Anjou, successfully established himself there, although soon again expelled. Shortly after our date, Louis XII of France and Ferdinand of Spain reconquered Naples (1501), divided it, and disputed and fought over it. Finally this lower half of Italy became part of the Spanish dominions. The feudal nobility was not yet quite extinct; but force and crime were rapidly terminating their little individualities. Southern Italy was, in A.D. 1500, in worse case than many other places.

(*a*) Hist. of Florence, p. 344.

Celebrities in A.D. 1500.—Savanarola has been dead two years—he who in Florence so strenuously insisted upon reforms in the church and elsewhere, and was tortured and burned for his pains. Torquemada the great Spanish Inquisitor (appointed 1483) curiously enough died in the same year. Erasmus, the Prince of Humanists (1467–1536) is 33 years old; Cardinal Wolsey (1471–1530) is 29; Sir Thomas More (1480–1535) is 20; Luther (1483–1546) is 17, and after 17 years more he will attach his theses to the Wittenberg door-post; Zwingle (1484–1531) the Swiss Reformer is 16; Ignatius Loyola (1491–1556) the great founder of the order of Jesus is 9; Melancthon (1497–1560) is 3; Cranmer (1498–1556) is just 2; and Calvin (1509–1564) is minus 9. What cart-loads of theology, good and bad, are we to get out of these men shortly; how certain was every one of them that he alone was right; and how clearly do we see what very human and fallible people they all were.

Of more service to the world than all of them, were Columbus (1436–1508) who was at the end of our millenium and a half, 46 years old; and Copernicus (1473–1543) who was 27.

Among the artists Fra Angelico (1387 to 1455) is dead; Michael Angelo (1475–1564) is 25; Titian (1477–1576) is 23; Raphael (1483–1520) is 17; Corregio (1494–1534) is 6; and Benvenuto Cellini (1500–1569) is just cutting his first tooth.

Machiavelli (1469–1527) is 31. The prince was written thirteen years after when he was 45.

Character of the Times.—These are stormy, dangerous and turbulent times, then, in which Machiavelli finds himself struggling—times in which both force and craft are needed if either a state or an individual is to keep afloat. Everything is unsettled; everything is trying to get itself settled, and everything is constantly finding that it cannot adjust and compose itself permanently this way, and must try some other. Self-preservation, the first law of nature, is also the most conspicuous; for other laws become prominent only when this one has ceased to influence daily action. In the words of some of the historians of the period;

"The era was that of a strong man, in both secular and ecclesiastical politics (*a*).

"In the conflict of France and Spain and Germany, the little Italian States had scant hope of preserving their independence

(*a*) Dunning's Political Theories, 286.

by material force, but like other weak powers under similar circumstances, they developed boundless resources of craft and diplomacy (*a*).

"In order to adjust the interests and balance of power of the different states into which Italy was divided, they were engaged in perpetual and endless negotiations with each other, which they conducted with all the subtlety of a refining and deceitful policy" (*b*).

"Power once acquired was maintained by force and the history of the ruling families is one long catalogue of crimes."

"The result was a perpetually recurring process of composition, dismemberment, and recomposition, under different forms, of the scattered elements of Italian life."

"Audacity, vigor, unscrupulous crime were the chief requisites for success."

"Capacity might raise the meanest monk to the chair of St Peter, the meanest soldier to the Duchy of Milan."

"The life of the despot was usually one of prolonged terror, poison, poniard" (*c*).

Nor was this all. Every reaction goes to excess; and the Renaissance was no exception to the rule:

"Humanism in its revolt against the Middle Ages was * * mundane, pagan, irreligious, positive, * * * Beneath the surface of brilliant social culture, lurked gross appetites, and savage passions, unrestrained by mediaeval piety, untutored by modern experience. Italian society exhibited an almost unexampled spectacle of literary, artistic, and courtly refinement, crossed by brutalities of lust, treasons, poisonings, assassinations, violence" (*d*).

Machiavelli.—Now in the midst of all this, Machiavelli is not, as frequently supposed, a mere moralist. He is not a moralist at all. Chiefly he is an observer, an investigator, an originator, a philosopher, an historian, an ambassador (twice at Rome and three times in France), and a statesman. His environment is not such as he made it, but as he found it; and he had to tread his way amid its distracted perplexities as best he could.

Several things were clear to his penetrating eye: first, that the strong and over-ruling tendency of the times was towards

(*a*) Dunning, 288.
(*b*) Prescott, I, p. 54.
(*c*) J. A. Symonds: Universal Anthology, XI, 167.
(*d*) Enc. Br. tit. "Renaissance."

nationalism; secondly, that Italy, much behind in this respect, was the battle-ground and the prey of the larger aggregations; thirdly, that political unification and territorial consolidation were produced by force and fraud and crime—by methods with which morality had nothing to do (Does any one dispute him, even now?); and fourthly, that for Italy's behoof it would be well if Lorenzo de Medici would redeem Italy "from the cruelty and insolence of the barbarians" (p. 160) as he termed the foreigners.

But Lorenzo must be well instructed for the task thus presented to him. And for this purpose the Prince was written and addressed to him.

And let us remember that Machiavelli makes no recommendations for any other days than his own. I have read to you that:—

"Were men all good this doctrine was not to be taught, but because they are wicked and not likely to be punctual with you, you are not obliged to any such strictness with them."

At another place he says:—

"For the present manner of living is so different from the way that ought to be taken, that he who neglects what is done, and follows what ought to be done, will sooner learn how to ruin than how to preserve himself" (*a*).

And further as Sir Frederick Pollock says:—

"Machiavelli does not approve or advise fraud and treachery as he has been charged with doing * * * He only points out that power gained in certain ways must be maintained, if at all, by corresponding means." It is not strange Sir Frederick adds "that a man living among Italian politics, such as they then were * * * should regard the separation of policy from morality as a remediless evil which must be accepted. There is no ground for saying that he did not perceive it to be an evil at all"(*b*).

"There is no reason to think that those amongst whom he lived saw anything shocking or incongruous in his writings"(*c*).

Machiavelli's other Characteristics.—Apart from what may be said of his political morality, it is undoubted that Machiavelli presents himself to us with many admirable characteristics. Sir Frederick Pollock for example testified that:—

"His own public conduct, so far as known (and he was a public servant for many years) was upright both abroad and at home."

(*a*) The Prince, cap. XV.
(*b*) Hist. of the Science of Politics, p. 44.
(*c*) Macaulay's Essay.

Macaulay says that:—

"We are acquainted with few writings which exhibit so much elevation of sentiment, so pure and warm a zeal for the public good, or so just a view of the duties and rights of citizens as those of Machiavelli."

"Though a dangerous enemy and a still more dangerous accomplice he could be a just and beneficent ruler. With so much unfairness in his policy, there was an extraordinary fairness in his intellect. Indifferent to truth in the transactions of life, he was honestly devoted to truth in the researches of speculation. Wanton cruelty was not his nature. On the contrary, where no political object was at stake his disposition was soft and humane. The susceptibilities of his nerves, and the activity of his imagination, inclined him to sympathise with the feelings of others, and to delight in the charities and courtesies of social life. Perpetually descending to actions which might seem to mark a mind diseased through all its faculties, he had nevertheless an exquisite sensibility both for the natural and for the moral and the sublime, for every graceful and every lofty conception. He had the keenest enjoyment of wit, eloquence, and poetry. The fine arts profited alike by the severity of his judgment, and the liberality of his patronage."

I have said that Machiavelli was not a moralist:—

"He did not at all deny the excellence of the moral virtues but he refused to consider them as essential to, or conditions of, the political virtues. Machiavelli's political man is as entirely dissociated from all standards of conduct save success in the establishment and extension of governmental power, as is the 'economic man,' of the orthodox school, from all save success in the creation of wealth" (*a*).

Or as Morley puts it:—

"the application of moral standards to this business is as little to the point as it would be in the navigation of a ship" (*b*).

"Always, thus, Machiavelli has in mind the necessity of the existence of the state as the first principle of his philosophy. The whole effect of this point of view is summed up in the dictates of unscrupulous patriotism" (*c*).

His achievements as a scholar and student and investigator are of marked excellence:—

(*a*) Dunning, p. 298.
(*b*) Romanes Lecture, 1897, "Machiavelli," p. 47.
(*c*) Dunning, p. 47.

"The influence of Machiavelli upon the history of political theories can hardly be exaggerated" (*d*).

"In the widespread and immediate influence which they exercised, probably no political writings have ever equalled those of Machiavelli" (*e*).

The originality of Machiavelli is very apparent:—

"In the first place it is necessary to recognize in his philosophy the formal and conscious separation of politics as a science, from the science of ethics" (*f*).

"He is in the fullest sense a student of practical politics, and he seeks to determine the workings of a real, not an ideal, political life. Imaginary and impossible states have for him no interest whatever. His purpose is to 'get back to the actual truth of things.' There is, he says, the greatest difference between the way in which men live, and that in which they ought to live; and the former, not the latter, is deliberately chosen as the subject of his investigations" (*a*).

"Machiavelli shewed how the history of a people can be written with a recognition of fixed principles, and at the same time with an artistic feeling for persons and dramatic episodes. On the other side he addressed himself to the analysis of man considered as a political being, to the anatomy of constitutions, and the classification of governments, to the study of motives including public action, the secrets of success, and the causes of failure * * * By which he added a department to the intellectual empire of mankind" (*b*).

"Machiavelli is, in truth, a giant among political thinkers, the greatest that had appeared since Aristotle * * * In his method of treating political problems, he is a new man in political philosophy. He appeals to history, not to revelation, for an answer to these problems. He divorces politics from theology, and follows reason instructed by history as his guide" * * To him, history is what natural phenomena are to the man of science; and he studies, weighs his facts apart altogether from any preconceived theological theory. It is this application of reason to history, untrammelled by traditional beliefs, that makes him a new man, a revolutionist in political thought" (*x*).

(*d*) Dunning, p. 322.
(*e*) Macnamara: 19th Cent., Vol. 40, p. 907.
(*f*) Dunning, p. 297.
(*a*) Dunning, p. 302.
(*b*) Ency. Br. tit. "Renaissance."
(*x*) Mackinnon: Hist. of Modern Liberty.

We have now passed our censures upon Machiavelli and given him the benefit of some excuses and mitigations, in turning from him to our own times let me quote the closing words of Macaulay's essay:—

"In the church of Santa Croce, a monument was erected to his memory, which is contemplated with reverence by all who can distinguish the virtue of a great mind through the contemplation of a degenerate age, and which will be approached with a still deeper homage when the object to which his public life was devoted shall be attained, when the foreign yoke shall be broken, when a second Procida shall avenge the wrongs of the people, when a happier Rienzi shall restore the good estate of Rome, when the streets of Florence and Bologna shall again resound with their ancient war cry, Popolo; popolo; muciano i tiranni."

Machiavelli to-day.—And now what of the year 1900? Is there anything of Machiavelli left, but a bad name? Or are there still some traces of his sinister methods to be found in the world?

Foreign Relations.—What of our politics? Are our foreign relations for instance,—our diplomacies, altogether free from the suspicion of duplicity and self assertion? Are our wars of aggrandizement based solely upon the motives inspired by the rule which requires us to do unto others as we would they should do unto us?

It is very easy of course to see that nations other than our own hardly make fair pretence of regulating their foreign affairs by any other standard than that of self-interest, and of achieving their ends by any other methods than those which seem for the moment to be best fitted for success. Russia's and Germany's huge thefts of Chinese territory are to our minds merely exhibitions of the law of the jungle—the law of the tiger; and Mr. Chamberlain, in describing the deceit practised upon his government by Russian diplomacy, made the very true and apposite remark that "he who supped with the devil must have a long spoon." Well, that is precisely what these other nations say about us; or rather they charge us not only with having very much the longest spoon, but with having handled it so skilfully and energetically that we have secured to ourselves more of the soup than all of the other ladlers put together (*a*).

They remind us of 1712, and that incident by which we rightly earned the name "perfidious Albion"; when Britain,

(*a*) Kidd's Social Evolution, 304, 318; Lecky's Dem. & Lib. I, 308; Spencer's Data of Ethics, 218."

being allied with Austria, Holland and other continental powers against France, entered into secret arrangements with the supposedly mutual enemy, while pretending to co-operate with the allies in the field (*b*).

They remind us of our Admiral Haddock at Cadiz in 1742; when pretending to blockade the Spanish fleet for the benefit of our friends, we really let it escape to their overthrow. Of which Carlyle said:—

"Europe admired with a shudder that refined stroke of art; for in cunning they equal Beelzebub, those perfidious Islanders, and are always at it, hence their greatness in the world. Imitate them ye Peoples, if you also would grow great" (*c*).

They remind us of Carteret, afterwards Lord Granville at Hanau in 1743. They remind us of Lord Bute's betrayal (as they call it) of Frederick the Great in 1762 (*d*) of which the London *Times* recently said:—

"The real reason why England has never been forgiven in Germany for her conduct to Prussia is that Lord Bute, the Prime Minister of England, did not scruple to betray to Choiseul the plans of Frederick, then the ally of England, for military operations against the French * * * At the present moment undoubtedly the most hostile of all powers to England is the new German Empire."

They remind us too of our Chinese Opium wars in the middle of the last century (*e*); and of the considerable properties we ourselves have somehow arranged to acquire in the Flowery Kingdom.

They remind us of our quite recent promises respecting Egypt (*f*). And they remind us of many other things in the way of broken promises, which we very much wish they would be kind enough to say nothing about. Of such episodes, Machiavelli said:—

"A prince therefore, who is wise and prudent, cannot or ought not to keep his parole, when the keeping of it is to his prejudice."

Army and Navy.—Machiavelli said nothing as to all being fair in love; but to save the State he permitted everything. And to-day every man who joins the army or navy of any country, divorces himself for the purposes of his profession from moral

(*b*) Lecky's Hist. of Eng., I, p. 138.
(*c*) Fred. the Great, V. 163.
(*d*) Carlyle, IX, 216, 229.
(*e*) 163 N. A. Review, 381.
(*f*) Ashley's Palmerston, I, 351.

considerations. He agrees to fight for his country, whether it is right or wrong; and he agrees to forfeit his life should he, in the time of peril, refuse to do his utmost to kill those, who by possibility, he may think to be justifiably and nobly defending their country. His own countrymen may revolt against oppression and he may deem them patriots; but he agrees to shoot them, if so ordered, as rebels. As Mr. Leckey has said:—

"A large and difficult field of moral compromise is opened out in the case of war, which necessarily involves a complete suspension of great portions of the moral law * * * It would be difficult to conceive a disposition more remote from the morals of ordinary life" (*c*).

The justification, of course, is the safety of the State. If every member of a community followed the dictates of his own opinion and of private moralities, the community would not long survive. Nationality means solidarity, and solidarity means the suppression of private conscience.

National Heroes.—An excellent test of popular attitude towards political morality is to be found in the character of the men whom the people delight to honor. Is morality in our ideals a prerequisite of their worship? We marvel at the Pagan Greeks tolerating the sensuality of their Pantheon. Generations later than ours will note that the 19th and 20th century Christians were little scrupulous as to the morality of their national demi-gods.

Napoleon.—The French have Napoleon for their hero—a man great in every department but that of morality; a man without pretence of conscience, or shadow of scruple.

Bismarck.—For the Germans, Bismarck is the popular ideal. That extraordinary man no doubt accomplished much. He made of many states one mighty nation. But political morality he held as lightly as Napoleon; and avowed it as cynically as Machiavelli. Not the golden rule, but "blood and iron" was his motto, and represented his method. His secret treaty with Russia in 1884, clearly derogating from his proclaimed alliance with Austria and Italy, is one of the most salient examples of his indifference to anything but success.(*d*) Everything had to be made subservient, he pleaded, to the one essential—the isolation of France. But even this treachery was outdone in perfidy by his cold-blooded alteration of the Ems telegram, by which he

(*c*) "Map of Life," p. 92.
(*d*) See 66 Fortnightly Rev., 904.

purposely threw the French into a frenzy, and deliberately precipitated the war which deluged their land with blood. His excuse was the danger of his country (*b*).

Machiavelli said of the unscrupulous scoundrel Cæsar Borgia: "He therefore who thinks it necessary * * * to secure himself against his enemies; to gain himself friends; to overcome whether by force or fraud; to make himself beloved or feared by his people; * * * to destroy and exterminate such as would do him injury * * * to manage himself so in his alliances with Kings and princes that all of them should either be obliged to requite him or be afraid to offend him; he, I say, cannot find a fresher or better model than the actions of this prince."

And the same may be said of Bismarck; and yet the Pope himself, after having acted as mediator between Spain and Germany, conferred the Order of Christ upon Bismarck, referring to him as Excelso viro, magno cancellaris; and this although Bismarck's May laws were still in force (*d*).

Rhodes.—In Great Britain no man of recent notability has been more widely and loudly acclaimed than Cecil Rhodes. And a great man, and great Empire-builder (Geography-grabber, our foolish rivals call him) he undoubtedly was. But his political morality was not a whit better than that of Napoleon or Bismarck.

The Jameson raid, which he organized, was of course nothing but a marauding, buccaneering invasion of friendly territory; but to my mind the principal disgrace attaching to that event is not so much the fact that he was guilty of murder (for which he was never punished), but that he published to the world, as justification for the raid, a concocted letter from the Uitlanders of Johannesburg, imploring Jameson at once to come to their relief—a letter which had been written several weeks before, with the date left blank so that it might be filled up when Jameson was ready. The attitude of Britain towards this outrageous defiance of law and decent neighborhood was frankly Machiavellian; and the general feeling was well reflected in contemporary verse:—

"Wrong, is it wrong? well, may be;
But I'm going boys, all the same.
Do they think me a burgher's baby
To be scared by a scolding name?

(*b*) Mallenson's "Refounding of the German Empire," 219, 220.
(*d*) Contemp. Rev., Dec., 1902, p. 789.

They may argue and prate and order;
Go tell them to save their breath.
Then over the Transvaal border
And gallop for life or death.

"I suppose we were wrong, were madmen;
Still I think at the judgment day,
When God sifts the good from the bad men
There'll be something more to say,
We were wrong, but we aren't half sorry,
And as one of the baffled band,
I would rather have had that foray
Than the crushings of all the Rand."

Machiavelli never wrote anything more abominable than that. Yet it is the product of our own time, and the language of the Poet Laureate of England.

After the death of Rhodes, his friends contributed many articles to the Reviews extolling his every quality, except his morality. Upon that point let me read to you what some of them said:—

Sidney Low (19th Century, May, 1902, 839) wrote:—

"Absorbed in the contemplation of the great ends, he was indifferent to the means by which his results were to be attained. His abhorrence of detail, he carried into the moral sphere; right and wrong were to be judged by large cosmic standards, not by the rules of a morality which I suppose he thought merely conventional. His vision of the future was too vivid to be blurred by such considerations."

Iwan-Muller (Fortnightly, May, 1902, 757, 8) wrote:—

"If my assumptions are granted (good purposes) I am not concerned to discuss the question of the morality of the means which Rhodes adopted to secure his ends * * * The shortcomings and even the vices of the most applauded of 'cosmic' heroes would, if exhibited by individuals, justify their exclusion from the society of decent men. Who would defend the character of Frederick the Great, if he had been plain Herr Schmidt? * * * If we are called upon to judge great men, we must judge them by the standard of great men, and not by that which we apply to the life and conduct of the men and women whom we jostle in the streets. * * * I make no claim for Cecil Rhodes that he was

a good man in the usually accepted sense of the term. I do claim that he was a great man, and a very great man, and as such he must be tried by the standards we apply to his equals in the court of history."

F. Edmund Garratt (Contemporary Review, June, 1902, 775), referring to the purchases by Rhodes of supporters and agents, wrote that:—

'The atmosphere it created was demoralizing and sometimes froze the support of men of more scrupulousness."

And Howard C. Hillegas (Oom Paul's People, p. 170) not a friend of Rhodes but an American historian of the period, wrote:—

"Mr. Rhodes did not consider it of sufficient importance to inquire concerning the justice of the Uitlanders claims * * * To Mr. Rhodes the end was sufficient excuse for the means." * *

Mr. Chamberlain took the same view as the Poet Laureate. In the House of Commons he said:—

"I am perfectly convinced that while the fault of Mr. Rhodes is about as great a fault as a politician or statesman can commit, there has been nothing proved, and in my opinion there exists nothing which affects Mr. Rhodes' personal position as a man of honour (*a*).

Murder and lying when committed by a cosmic hero, do not affect his personal honour. Machiavelli said nothing worse than that.

Now these are our national heroes; and they force us to admit that morality is not an essential ingredient in the man we delight to worship and build monuments to. Did you ever read Carlyle's essay upon the proposal to erect a brass statue to Hudson, the great English railway king, who "set all the towns of Britain a dancing," and who made dying railways "blossom into umbrageous flowery scrip to enrich" his worshippers? Read it to-morrow. The advice from Chelsea is not to build a brass column to such a man, but to dig a coal-shaft to him, "there to bury him and his memory that men might never hear nor speak of him more." Carlyle is splendid. He seeks, he says:—

"To admonish the misguided citizens, subscribers to the next brazen monster, or sad sculptural solecism, the emblems of far sadder moral ones; and exhort them, three successive times, to make warming-pans of it and repent; or failing that, finding them obstinate, to say with authority: 'well, then, persist; set-up your

(*a*) The Times, 27th July, 1897.

brazen calf, ye misguided citizens, and worship it, you, since you will and can. But observe, let it be done in secret; not in public; we say in secret at your peril! You have pleased to create a new Monster into this world; but to make him patent to public view, we, for our part, beg not to please. Observe, therefore: Build a high-enough brick case or joss-house for your brazen calf; with undiaphanous walls, and lighted by sky-windows only; put your monster into that and keep him there. Thither go at your pleasure, there assemble yourselves and worship your bellyful, you absurd idolators; ruin your own souls only, and leave the poor population alone; the poor speechless unconscious population, whom we are bound to protect and will" (*b*).

Aggrandizement not Morality.—But the world is not ready yet for Carlyle. The Bishop of Hereford, recently writing in the 19th Century (*c*) said:—

"There stands before us the plain facts that after eighteen centuries of christian teaching and influence in Europe, a great deal of our public life, both at home and abroad, although in the hands of christian statesman, is to all practical intents and purposes still carried on as if the sermon on the Mount had never been spoken, and only the lower and selfish motives had a rightful claim to exercise dominion in practical affairs." * * *

"The point is that honest and good men do not seem to recognize those standards of ethical judgment which they accept without question in private life, as having the same claim on their allegiance in the arena of politics or in the relationships of nations." * * *

"The terms in which national or imperial aims and policy are defined, and the spirit in which international affairs are conducted, are such as to make it only too plain that the whole structure of foreign politics, and also a great part of internal politics, are built upon a foundation of selfishness, jealousy, rivalry, greed of power and wealth, and not upon any higher or christian basis."

Frederic Harrison (quoted in the article just referred to) wrote:—

"The key to all rational estimate of European politics is to recognize that the dominant factor in them to-day is the passion of national self-assertion—the struggle for national supremacy.

(*b*) Latter-Day Pamphlets, 223.
(*c*) Vol. 48, p. 227.

For right or wrong the great nations are resolved to make themselves as big, as formidable, as extensive, as rich, as science and energy can make them, or at least to tolerate no other nation bigger than themselves."

John Morley (also quoted by the Bishop) referring to England's foreign affairs said that:—

"The language of England hardly affects to be moral language. It is the language of pride, of mastery, of force, of violence, of revenge."

And Lord Dufferin, than whom no one had a better and more honorable experience in diplomacy, told an audience in Belfast on the 28th October, 1896, that

"Force and not right is still the dominant factor in human affairs."

These are the facts, now listen to Machiavelli's—I mean the Bishop of Peterborough's justification of them:—

"It is not possible for the state to carry out in all its relations all the precepts of Christ, and a state which attempts this could not exist a week."

"It is clear therefore that a state, in order that it may be a faithful trustee, is bound, first to preserve its own existence, and secondly to resist, restrain, and even if needs be to destroy, whatever and whomever assails its authority or attacks the interests committed to its charge. Self-preservation therefore, and the preservation of all that is entrusted to it, are the moral obligations of every state" (*a*).

That is precisely what Machiavelli said.

William Clark, recently writing in the Contemporary Review says:—

"For state ends anything may be justified—such is the real opinion of nearly every statesman whatever moralities he may indulge in coram publico * * * Without being laudator temporis acti one may fairly say that the morals of Machiavelli have become a more marked feature in Europe than a generation ago * * * We all incline to hold now, with the German doctrine, that the world movement is independent of morality" (*a*).

Frederick Greenwood, one of the ablest and most respected of England's publicists, recently writing in "Cosmopolis", said:—

"The individual and the community are not, I think, equally

(*a*) Fortnightly Rev., Vol. 53, p. 33.
(*x*) Vol. 75, p. 1.

subject to the moral law; and when the existence of the state is in jeopardy, its government must take the means by which the peril can be averted, even though they are immoral, judged by the obligations of immorality between citizen and citizen within the state itself. It comes to this, when rightly and fairly expressed, as it very seldom is: If nothing else will help to secure the existence of your State in freedom, you may do anything that a wild animal will do—knowing nothing of God, or devil, or sentiment, or morals, or any sort of point d'honneur—for his life and liberty. And you may do anything that a wild animal would do if he had a finer cunning and no more conscience.."

I take Mr. Morley's Romanes Lecture (1897) on Machiavelli as a contribution to the same view. Principal Cairns has said:—

"The code of morals and even of manners as between nations is such as no modern civilized society would tolerate as between its citizens. If we are to take the popular press of Europe and America as fair indicators of international feeling, the eight great powers of Christendom treat one another like ruffians in an East-end slum or a mining camp, rather than like gentlemen or still more Christians. They swagger and boast, they glory in one another's disaster, and are full of the meanest envy and detraction when any one of them is successful. They threaten and bully unblushingly, and all their effusive international courtesies are always with a view to some personal gain, and even in the background there lies the appeal to the revolver or the knife" (*a*).

Finally, Mr. C. J. Dillon a well-known English publicist has said:—

"Politics are still the negation of ethics, diplomacy the conventional drapery of legalized chicanery, and Christianity a body of sublime teachings which may be assimilated by individuals, but seldom contribute materially to shape the conduct of Governments" (*b*).

The Germans as usual have been thinking a little more deeply upon this subject than the rest of us, and endeavouring to make it intelligible and philosophically acceptable. Allow me to read to you short extracts from a very recent book by Chancellor Ruemelin of the Tubingen University asking you to compare him with Machiavelli as I proceed:—

(*a*) Contemp. Rev., January, '04, p. 51.
(*b*) Contemp. Rev., Nov., '03, 728.

"Yet we must admit, be the contradiction real or only apparent, that there are certain actions permitted by the code of political ethics, but prohibited by the moral law. (P. 25).

"It would, however, be quite as illogical as it is impracticable, to demand from the community itself the same course of action or omission as from its members. (P. 32).

"Moreover, how can the golden rule be applied to the relation of one State to another? (P. 34).

"Nevertheless, the relation of the State to justice differs essentially from that of the individual. (P. 37).

"Historians will not praise it, poets cannot glorify it, but nobility and magnanimity are not predicates which statecraft can court most successfully. (P. 44).

"An unqualified obligation on the part of a State to observe treaties made or recognized by it, cannot be maintained. (P. 45).

"Politics, as all human action, is subject to the authority of moral duty, but the moral law which prescribes virtues and duties for the individual is not available in the conduct of public affairs. This phase of ethical law is essentially foreign to politics. Altruism is the gospel of the citizen, self-preservation that of the state. (P. 48).

"Is politics subject to the moral law of private life? must be answered in the negative. Does politics possess an independent principle for the guidance of its action? in the affirmative. These answers merely re-affirm the truth of the old maxim, salus publica suprema lex esto; all other considerations are subordinate to the preservation and well-being of the community. (P. 49).

"The interests of a foreign state can be regarded only in so far as they do not conflict with our own. In politics, at least, the preservation of the state justifies every sacrifice and is superior to every commandment. (P. 59).

"The claim may be made that the main question at issue is, whether or not it is justifiable to commit, in the interests of the public weal, actions which are unconditionally forbidden by law and morality. (P. 66).

"The conditions in which the higher interests of a state or a nation are at stake transcend ordinary rules, and principles, and they upon whom supreme responsibility rests can hardly afford to be impeded by the threads of casuistry. (P. 72).

"On the other hand, we can hardly fail to notice in the management of public affairs an increasing tendency toward nobler ends." (P. 75).

"It may be the clear duty of an individual to sacrifice his life for the good of others, but are any circumstances conceivable in which it would be as clearly the duty of a nation to extinguish its national existence for the benefit of other nations or of humanity at large? (P. 106).

"But look upon nations as what they really are—aggregations of citizens, holding each other's interests in mutual trust,—and then the moral significance of what is called national selfishness is wholly changed. It ceases to be selfishness in any proper sense of the word. It becomes patriotism; and the rulers of a nation who would sacrifice its interests to those of other nations would be guilty of a breach of trust, whether the ruling power be one or many, a despotism or a democracy. (P. 108)

"Heffter says that a state may repudiate a treaty when it conflicts with the rights and welfare of its people." (P. 115)

"Blumtschli thinks that a state may hold treaties incompatible with its development to be nil." (P. 115).

"The doctrine of M. Fiori accepts all the extravagances which are the logical consequence of these views. According to him, all treaties are to be looked upon as null which are in any way opposed to the development of the further activity of a nation, and which interfere with the exercise of its natural rights." (P. 115.)

Domestic Politics.—Such then being the condition of international politics, what are we to say of our domestic party affairs? Has old Nick any hope of harvests from that field?

Now altogether the worst feature about our Grit and Tory methods is not that they are as bad as they can be, but that they are quite frankly so. I heard a Minister of the Crown publicly defend his frankness the other day by saying that he would rather be a publican than a pharisee anyway. He seemed to think that he was all right if he made no foolish professions. In a speech of a few years since to the Toronto Conservative Club, Mr. Geo. E. Foster said:—

"We do not want any longer, what I am afraid however we will have for some time to come—that devil of political corruption. It is abroad everywhere in our local, provincial and dominion contests. It is in the Grit and Liberal-Conservative party alike. It is the one thing more than anything else that takes away hope from me when I talk with men" (*a*).

(*a*) 29th May, 1898.

In the same speech Mr. Foster furiously assailed the Government as a "blatant organized hypocrisy." And then he appealed to everybody not to be a mere neutral man, but to join either one party or the other.

"The purely neutral man (he said) is a menace to society and we ought to have none of them."

Now a clear-headed man like Mr. Foster, if he would reflect a little, must acknowledge that he does not hold out very strong inducements to these neutral men; for he admits that the choice which he presents to them is "a blatant organized hypocrisy" on the one hand, and at the best the plain devil of corruption without hypocrisy upon the other. Of course if it were only a question of whether you would choose to be a publican or a pharisee, an avowed or a concealed corruptionist, you would of course enlist with the gentleman without the varnish. But does it not occur to Mr. Foster that there may be people who do not like the devil at all, whether with or without phylacteries or feathers, as a club or party associate?

It is worthy of note that not long since a body of gentlemen with, I have no doubt, the best intentions in the world, formed a society or union in Manitoba for the purpose of reforming politics and as a protest against the shameful, or rather shameless corruption of both political parties. They did very well, until they undertook to elect one of their number to Parliament, and indeed until having elected him their methods of operation were attacked in the courts, when alas! their member too was unseated upon the old familiar ground of corruption by agents. There is something that is said to stick closer than a brother. Is it corruption to political parties?

Observe too that there is the same necessity for solidarity in party politics as in war. Discipline and obedience, here also, are prime necessities of success. What your leader says, you must say; or if you differ with him you must at least conceal your opinion. If you don't you will be dubbed traitor, and possibly "read out of the party."

Oppositions.—Lord Randolph Churchill was much more frank than moral when he said that "it is the duty of an opposition to oppose." Let any Government propose anything, I care not what it is, and the opposition at once condemns it, and endeavors to convince the electors that it is not only superlatively bad, but frequently that it is underlaid by some rascally motive. If the

Government had done anything else, it would have met w th the same misrepresentation and villification. Machiavelli said:—

"It is convenient that his mind be at his command, and flexible to all the puffs, and variations of fortune."

But I was wrong in saying that our oppositions oppose everything. No, there is one noteworthy exception, and that is the trivial matter of hundreds of thousands of dollars of railway bonuses. Now what is the reason for this extraordinary exception. Perhaps we can find the explanation in the language of Mr. E. B. Osler, one of the Directors of the Canadian Pacific Railway who in 1898, from his place in the House of Commons said:—

"I contend that these subsidies are the main source of corruption in elections such as we are having exposed. It is from such subsidies that the money is supplied to pay the men who have been engaged in the ballot box stuffing, and the election frauds which we hear so much about. These men are not committing these crimes for nothing. They are paid with the money of the people. What else can you expect when a Government stands with open hands and says to every section of the country—apply to us and we will give you any possible government aid. That has been the position the present Government has taken in regard to these railway subsidies. That was the condition that existed before they came into power. These lavish votes of public money from whatever government they come, must tend to corrupt the morals of the people."

It is my humble opinion that Mr. Osler was perfectly correct; and that the reason that oppositions do not oppose railway-bonuses is that they expect to get portions of them at the next elections. Their only excuse is that they will need the money as much as the Government, and will apply it to the support of a better cause. They might quote from Machiavelli:—

"Were men all good, this doctrine was not to be taught, but because they are wicked and not likely to be punctual with you, you are not obliged to any such strictures with them."

Governments:—Opposing everything while out of power produces frequently some inconvenient embarrassment upon the assumption of office; and not seldom is the new Government censured for leaving unrepealed all the "iniquitous" measures of their predecessors. Under such circumstances (and we seldom have to go further back than the last change of administration for an example) Machiavelli offers much consolation when he says:—

"It is honorable to seem sincere and indeed to be so, provided your mind be so rectified and prepared that you can act quite contrary upon occasion * * * Nor was there ever any prince that wanted lawful pretence to justify his breach of promise."

Let me say, however, that in Machiavelli's opinion, deceit was justifiable only when it was necessary in order to save the state. I have my doubts as to whether he would defend it when used to further the ends of a political party, which might find difficulty in distinguishing itself from its opponent.

The Churches:—Machiavelli's central idea may be said to be that the truth was not sufficient for man's purposes in this world, and he permitted deceit wherever necessary for the preservation of the state. And now the charge which I have to make against the churches is that to some extent, and for their own safety, they act upon the same principle.

I do not refer to the fact that theology has usually been found to be in opposition to the developments of secular thought; for in that the churches were, although mistaken, yet perfectly conscientious. I refer rather to their present position with reference to the well-established results (I do not say the mooted questions) of the higher criticism. That these results necessitate a thorough revision of orthodox conception of biblical inspiration (I do not say the abandonment of all belief in inspiration) is now beyond all question; but the general pulpit proceeds as though nothing had happened.

Not long ago I heard a lecture from a professor of one of our theological colleges on the subject of the relation of the higher criticism to public preaching. The lecturer reasoned the matter pro and con, referred to the danger to people's faith, and closed with these five fatal words "moral, say nothing about it."

In the church of the Holy Sepulchre, on every Easter Day, the lights which have been then burning for twelve months are put out, and some of the Priests of the Greek Church shut themselves up in the little chapel, under the central dome of the church, in which the tomb of Christ is said to be; to these priests fire comes down from heaven, and it is hailed with enthusiasm by the rapturous crowds who crush one another in their eagerness to light their torches at the new flame. When in Jerusalem, I asked the American Consul how these Greek Priests (many of them handsome, intellectual fellows, with faces not unlike the traditional

face of Christ himself) could practice such deception, and I was told that it was only the ignorant who believed in the miracle, and that the Priests merely "said nothing about it."

Now, I see no difference in principle between the studied silence of these two cases, for in both of them people are misled by the silence. For example, a preacher on some Missionary Sunday says "Let us read the word of God as contained in the 16th chapter of Mark"; and although he knows quite well (as the notes of his revised version assert) that "the two oldest Greek manuscripts, and some other authorities omit from verse 9 to the end. Some other authors have a different ending to the gospel"—although he knows that, yet he acts upon the professor's "moral, say nothing about it." In my humble judgment that preacher is guilty of deceit, and is as fairly chargeable with treason to the truth as are the Greek Priests with their miraculous fire.

And how can we excuse adherence to the old—the King James English version of the Bible, when we have a much more accurate one. If any Minister tells me that in his opinion the old one is a more faithful rendering of the original, then I admit his right to use it. But for all the others what can be said? Suppose you received a letter in some language which you did not understand (not a very important letter, one just ordering $5 worth of goods) and you were offered two translations of it—one accurate and the other inaccurate, there can be no doubt that you would smile very loftily at any one who told you to read the wrong one, and who affirmed that these were the words sent by your correspondent. And yet here is the Bible, read to you as God's word from heaven; and you stand up to listen to it, so great is your reverence for it; and the reader knows perfectly well that in the little chapter he is reading there are a dozen or a score of misrepresentations of what was written. Machiavelli said that the maintenance and safety of the state was of importance, but that the character of the means thereto was indifferent.

It is some encouragement to speak in this fashion that there is an ever-increasing number of the clergy who agree that not only is this say-nothing-about-it policy dishonest, but that it is disastrous—that so far from saving the churches it is destroying them. Henry Drummond's warning ought to be sufficient. George Adam Smith tells of the many applications made to Drummond by persons, "one and all" of whom told him that "the literal acceptance of the Bible * * * is what has driven

them from religion." The applicants "had abandoned or were about to abandon" their "belief in the goodness of God", yet they eagerly sought an explanation which would save them from such a disaster" (*a*).

The Rev. Dr. Milligan too, during the course of a series of sermons upon the higher criticism in Toronto, said:—

"In studying the Bible it is necessary to be cautious, but it is also necessary not to be afraid of the facts. A man who is afraid of truth is also an infidel of the worst species, because truth can only do good."

Now, I would not like to call the Professor to whom I have referred an infidel, but he certainly has not that faith in the truth which will remove mountains. He thinks that it ought to be wrapped in a napkin, put away in a locked drawer somewhere (*b*), and made to keep quiet. He has not the faith of James Russell Lowell:—

> "Get the truth but once uttered, and 'tis like
> A star new-born that drops into its place,
> And which, once circling in its placid round,
> Not all the tumult of the earth can shake" (*c*).

Business.—For frauds in the flotation of companies, secret commissions, lying advertisements, Machiavelli is not an apologist. Nor has he anything to say about the opposition between the religion of amity and the religion of enmity (as Spencer calls them.) To save the State, he would disregard all morality; but he gives no advice as to the limits of propriety in business competitions. The questions which arise in this connection are difficult, and with two quotations I leave them for your consideration. Professor Giddings said:—

"Six days in the week we diligently follow the precepts of the law of competition; on the seventh we as diligently contemplate the beauties of the law of compassion. Mr. Spencer accurately traces this contradiction in conduct back to its origin in social experiences of the past; but he might have gone yet farther and have shown that in reality it is as fundamental as the distinction between the integrational and the differentiational aspects of universal evolution itself. While evolution continues, two standards are inevitable, and we must try as best we can to reconcile

(*a*) Modern Criticism, etc., p. 27.
(*b*) As Carlyle once said of himself.
(*c*) "A glance behind the curtain."

and co-ordinate them. As long as co-ordination is still imperfect we must at one time be hostile, at another time benevolent; at one time remorseless, at another time compassionate; unless we are prepared to see all moral activity disappear in brutality on the one hand or in degeneration on the other" (*a*).

A former Lord Chief Justice of England said:—

"It must be remembered that all trade is and must be in a sense selfish; trade not being infinite, nay, the trade of a particular place or district being possibly very limited, what one man gains, another loses. In the hand-to-hand war of commerce as in the conflicts of public life, whether at the bar, in parliament, in medicine, in engineering (I give examples only) men fight on, without very much thought of others, except a desire to excel or defeat them. Very lofty minds like Sir Philip Sydney, with his cup of water, will not stoop to take an advantage, if they think another wants it more. Our age, in spite of high authority to the contrary, is not without its Philip Sydneys; but these are counsels of perfection which it would be silly indeed to make the measure of the rough business of the world as pursued by ordinary men of business" (*b*).

In other words "counsels of perfection" are not adapted to business; but it was not Machiavelli that said so, but the Lord Chief Justice of England 400 years afterwards.

The Lawyers.—I have no desire to shield my own profession, nor am I so prejudiced in its favor that I would assert for it a morality superior to that which obtains in other professions or occupations. Upon the contrary I confess to a growing distaste for some of its methods, and impatience with some of the work which it is called upon to do.

That we are hired mercenaries (as we have been called) I cannot deny; and although possibly we might be described in more courteous language, yet here we are not merely ready, but sworn to accept the cause of any man who chooses to pay us our fees. We are not bound, indeed, to fight unfairly; to wrest the evidence; or even to present an argument that we believe to be unsound. Nevertheless, when the spirit of the fight is upon us, we lose touch with these finer sensibilities, and struggle to win as though life itself depended upon the result. We fight for personal supremacy, and too often if that be obtained by an advocate, he is

(*a*) Dem. and Emp., p. 353.
(*b*) Mogul Steamship case.

not scrupulously careful of the means which he uses to accomplish his purpose. I have sometimes thought that the judges might help more than they do, in the formation of healthier and higher ideals of forensic conduct; but I am afraid that the defects to which I have alluded are too inseparably a part of the competitive system to hope that the lawyers shall take the lead in the exit from what is sometimes called Machiavellism (*a*).

Crime and Modern Society.—The partial picture which I have thus attempted of present-day affairs must be still further darkened. For statistics leave us no room for doubt that the quantity of crime is ever on the increase; and that, measured merely by the number of offences against the law, the day of Machiavelli was very much better than our own. Let me give you some figures taken from a recent and excellent work by Dr A. G. Hall, of Columbia University (Crime in its Relations to Social Progress.)

"In Germany convictions rose from 329,968 in 1882, to 463,584 in 1897. In Austria the increase was from an average of 1331.7 per 100,000 of the population in 1871-5, to 2277.2 in 1891-4. In Italy from 514.58 per 100,000 in 1881-5 to 740.37 in 1891-5. In England and Wales the number of persons held for trial has nearly doubled within forty years; rising from 389,502 in 1857, to 720,441 in 1896."

The Paradox.—Do I then say that morality has relapsed during the last 400 years? No, far from it. Upon the contrary, progress, although slow, has been well marked. But how so? The Clergy and lawyers and society are as bad now as then, and crime has very much increased, and yet you allege improvement?

My friends, at first sight the statement is paradoxical, but it is nevertheless true, that one of the best tests of a rising morality —a rising civilization and culture—is an increase in the quantity of crime.

See what I mean:—Suppose that for the first time a liquor-license, or a prohibition Act is adopted, what is the immediate effect? Undoubtedly an increase in crime? Many acts which were unbranded before, are now declared to be criminal—the list of crimes has been lengthened, and the number of offenders consequently increased.

Until the reign of Victoria embezzlements of many sorts—by agents, trustees, &c., were disregarded by the criminal law.

(*a*) See Lecky's Map of Life, p. 109.

Scores of such acts are now criminal, and there are consequently very many more malefactors.

Compare original with present society, and my point will be quite clear to you. In earliest and most rudimentary conditions there is no crime at all. There are murderings and thievings, no doubt, but these are not crimes against society. They are merely wrongs against persons—just as until lately were these embezzlements to which I have referred.

No crimes at the beginning of our history, and a constantly increasing list down to the present day, until now almost every year adds on some more—what does that mean? It means this: that we are constantly acquiring a better and clearer view of what is involved in our duty to our neighbor; that our sensibilities are more refined; our criticism of conduct more censorious; and our appreciation of righteousness more emphatic and declaratory, more intolerant if you will.

And note that I did not say that the weight of crime had increased, but its quantity merely. Eliminate from our apparently appalling list of convictions those for the more modern offences, and you will reduce it to something quite insignificant. I do not wish to be understood as asserting that there are more assassinations now than in A.D. 1500; but that the criminal code, merely, is longer.

"What is the growth in civilization but increase of the knowledge that makes us conscious of sin" (*a*).

Observe too that while I affirm that diplomacy is not, and probably never will be, quite dissociated from deception; yet that I am thoroughly convinced that opinion has undergone so remarkable a change that while Machiavelli could say in his day that if a prince can "continue his supremacy, the means which he uses shall be thought honorable, and be commended by everybody," that affirmation can no longer be made. Upon the contrary I am satisfied that people are slowly learning to distinguish between success and the means of its achievement; and to be able to applaud the one while condemning the other. As Chancellor Ruemelin says, "We can hardly fail to notice in the management of public affairs, an increasing tendency toward nobler ends." (P. 75.)

Political corruption in its present form of bribery of the

(*a*) Fairbairn: "Phil. of the Christian Religion," p. 151.

electors is one of the modern criminal offences. Crimes are those anti-social acts which are consciously condemned by society; and acts once thought innocent rise to the category of crime through slow perception of their obnoxious character, and tardy conviction of the necessity for their punishment. Go back no further than the time of Walpole, when not merely, or principally, voters were bribed; when constituencies, like houses, had owners who sold them to the highest bidders, who in their turn sold themselves to the government of the day; and when all this and much more (*a*) was done without shame or thought of blush—go back a century and it is undeniable that defective as is our present day condemnation of political immorality, our detestation of former species of it is certain and satisfactory.

And let me excuse the churches too. Their present sins are of recent origin, and the parsons are staggering not from bad faith or thought of flagitious deception; but simply because they have not yet quite fitted themselves to their new surroundings. And while criticizing the clergy as we sometimes do (and healthy criticism is good for everybody) let us never forget the vastness of the debt that humanity owes to those noblest of men. Let us remember that the churches are the only organizations that we have, whose mission and purpose it is to combat vice and immorality, and mere selfishness, and worldliness. Differing with their theology as some of us do, no one can be absurd enough not to acknowledge their magnificent and indispensable services to society, in their never-ending charities, and sympathies, and kindnesses. If Christ were upon earth to-day, he would say to the clergy as he did to his earliest disciples, "Ye are the salt of the earth," and I think that they are reasonably careful of their savor.

I recognize too the antimony presented by the opposing religions of enmity and amity. Mr. Lecky's last book is very suggestive in this connection. His reflections lead him to say that:—

"The necessities for moral compromise I have traced in the army, in the law, and in the fields of politics may be found in another form not less conspicŭous in the church" (*b*).

But I believe that Spencer is undoubtedly right when he says that:—

"Of these two religions taught us, we must constantly re-

(*a*) Walpole's History of England, IV, 140, 208.
(*b*) "The Map of Life," p. 193.

member that during civilization the religion of enmity is slowly losing strength, while the religion of amity is slowly gaining strength."

This is true because nationalism with its huge aggregations has removed most of us from the enmity engendered by direct participation in foreign quarrels; because travel has rubbed off some of our foolish conceits and prejudices; because commercialism is cosmopolitan; and because of clearer and better views of larger relations.

I am no moral pessimist then. Upon the contrary my reading helps me to recognize those things around me which I condemn, as the mile-stones which mark, possibly at century distances, the laborious passage from savagery to an ever higher and better civilization. The world is more criminal because it is more christian. It will be more christian still. The list of offences against ever-increasing moral sensitiveness will lengthen at the one end, while the grosser and more carnal sins, at the other, will become so abhorent that they will almost entirely cease (*a*). Already we more clearly recognize the brotherhood of man; the duty imposed upon wealth to share it with the needy; and the obligation to care not only for the health, but the education also, and the moral training of the young (a very recently accepted idea.) Even in our Law Courts we have adopted the high standard of conduct which

"Enforces the duty of fellow citizens to observe, in varying circumstances, an appropriate measure of prudence to avoid causing harm to one another" (*b*).

It is no doubt some distance from that to the adoption of the golden rule as the law of the land. But progress is in that direction. We are already occupying solid stages in the apparently impossible ideals of the past. Those which we now indulge may still be attainable, and when the last is reached it may prove to be none other but that contained in the great command, "Do unto others as you would that they should do unto you."

(*a*) Hall's Crime and Social Progress, 45.
(*b*) Pollock on Torts, 5th Ed., p. 22.

The Romance of the Fur-Trade.

By Lawrence J. Burpee, Librarian Carnegie Library.

[*Read Feb. 8th*, 1907.

As the history of the fur-trade runs back into prehistoric times, and the field is as wide as the earth, and as it is packed with romance as far back as we can get any glimpse of it, anything like an exhaustive treatment of the subject would be inexpedient. A twenty-four hour lecture would no doubt be a novelty, of one kind or another, but it may be wiser to sacrifice completeness, even at the risk of being superficial. Limiting the field, then, to North-Western America, it may be possible to pick out a few incidents that will serve to illustrate, however imperfectly, the romantic side of the fur trade; and incidentally to suggest the rich mines of history and ethnology, of nature and human nature, that we possess in the narratives of the western fur traders. Such men as La Vérendrye, Samuel Hearne, Alexander Mackenzie and Simon Fraser, David Thompson, Umfréville, Franchère, Ross Cox, Harmon, the two Henrys, and a score of others, have left behind them narratives of permanent value and absorbing interest; the simple, unassuming records of men of action; the stories of our western pathfinders and earliest pioneers, who knew that wonderful land of boundless plains, gigantic mountains, and vast inland seas as it was a hundred years ago, while it was still in every sense the home of the Red man.

From first to last, the story of the western fur-trade and the story of western exploration are one and indivisible. The men who penetrated the west, who gradually pushed back the veil of the unknown and revealed the vast proportions of our continent, were in nearly every case fur-traders, and generally members of one or other of the great fur-trading companies whose trading posts marked, in more ways than one, the extreme limits of civilization. In them the practical and ideal were curiously blended. The one object of their lives was supposed

to be the bartering of the minimum value in trading goods for the maximum value in peltries; but wittingly or unwittingly they moved towards a quite different gaol. The same spirit of adventure that drew their forefathers across an untravelled sea to the discovery of a new world, kept the eyes of these fur-traders turned ever toward the setting sun. Generation after generation, French and English, they responded to the call of the west. As the earlier discoverers had sailed the ocean to the shores of this western continent; so these men, following a similar impulse, crossed the continent to another and greater sea.

To fur-traders and explorers alike the remarkable system of waterways that covers North America like a gigantic web was of vital importance. The story of the exploration of Western America is really the story of the opening up of the river systems of the continent. In their relation to the problem of interior transportation the waterways of North America are perhaps the most remarkable in the world. It is literally true that a man might start in a canoe from Quebec or Montreal, and with nothing more serious than an occasional portage reach by water Hudson Bay or the Gulf of Mexico, the Arctic Sea, or the Pacific. And this is not merely theoretically possible; it has answered the test of practical experience. Canadian fur-traders and explorers, French and English, actually travelled in bark canoes from the St. Lawrence to the mouth of the Mississippi; to the mouth of the Mackenzie; to the mouth of the Nelson; to the mouth of the Columbia.

As the rivers and lakes of Western America were the highways of the fur-trade, the portages connecting one great waterway with another became strategical points in its development. When the first French traders entered what is now Western Canada, one hundred and seventy-five years ago, they crossed the most famous of all the portages—Grand Portage, about forty miles south of the present town of Port Arthur. This was what might be called the jumping-off-place for the western fur country. It was the connecting link between the Great Lakes and the waterways of the plains; between the civilized east and the uncivilized and unexplored west.

Many years after, when the first English traders from Canada, following in the footsteps of the French, reached Cumberland lake on the Saskatchewan, they turned north by way of Sturgeon-Weir

river, and discovered the second great portage of the west—Frog Portage, connecting the waters of the Saskatchewan with those of the Churchill.

Still later, other Canadian traders ascended the Churchill through Ile à la Crosse lake and reached Methye Portage—connecting the Churchill with Clearwater river, a tributary of the Athabaska, and thus opening up the immense valleys of the Peace and Mackenzie rivers.

It may help to a clearer understanding of the subject to trace briefly the routes of the fur-traders from the east to the west. Under the French régime the field of the fur-traders spread out gradually from the St. Lawrence to the country about Lake Superior. To some extent the traders followed the southern route by way of Lakes Ontario and Erie, but from first to last the main highway to the west was up the Ottawa to Lake Nipissing, and down French river to Lake Huron, thence to Lake Superior or Lake Michigan and Green Bay. Many portages led from the Great Lakes to the Mississippi; one by way of Lake Erie and the Ohio, another from the foot of Lake Michigan to the Illinois, and a third from Green Bay by way of the Fox and Wisconsin rivers. From Lake Superior two routes were followed; one up the Kaministikwia river, the other the Grand Portage route. Both led to Rainy river and Lake of the Woods, thence down the Winnipeg river to Lake Winnipeg.

Lake Winnipeg was in a sense the pivotal point in the whole system of water transport, east, west, north and south. The men of the Hudson's Bay Company reached the lake from their trading posts on the bay by several routes, the most popular of which was, and still is, by way of Hayes river, at the mouth of which stands York Factory. The Nelson was used for a time, but on account of the extreme difficulties of navigation was never popular. Other occasional routes were by the Severn, and the Albany.

From Lake Winnipeg the highways of the fur-trade branched out in every direction. The Red river led down to the headwaters of the Mississippi; the Assiniboine and Souris carried the trader out into the heart of the buffalo country and within easy reach of the Missouri; the Saskatchewan led him by several routes to the Rocky mountains and the waterways of the Pacific coast. At the headwaters of the two branches of the Sas-

katchewan, of the Athabaska, and of Peace river, he found passes through the mountains to the Fraser, the Kootenay and the Columbia. As already mentioned, Frog portage carried him from the Saskatchewan over into the Churchill, and Methye portage to the Clearwater and Athabaska. The Athabaska brought him to Lake Athabaska. From thence he reached the Peace river, and, by way of Slave river, Great Slave lake. At the western end of Great Slave lake he entered the mighty Mackenzie, and floated down its broad stream to the Arctic; or he turned off into the Liard, and by way of Pelly river reached the Yukon. Again, from the eastern end of Great Slave lake he might reach the Barren Grounds and Backs river, and so once more to the Arctic.

Nominally the men who led the way toward the Pacific were fur-traders first and explorers afterward; but three at least, and those the most notable, were explorers first and only incidentally fur-traders—Pierre de La Vérendrye, Alexander Mackenzie and David Thompson. To these three the fur-trade was but a means to an end. They had neither capacity nor heart for the traffic in peltries, and though they were too conscientious to deliberately neglect the work entrusted to them as traders, they bent it to meet the needs of their great projects of geographical discovery.

Nothing could be more romantic than the story of Pierre Gaultier de Varennes, Sieur de La Vérendrye. Born in the little town of Three Rivers, he listened as a boy to the stirring tales of fur-traders and *coureurs du bois* who had ranged far and wide throughout the wild country north of the St. Lawrence, the Ottawa and the Great Lakes, and who told him of a marvellous region to the westward of Lake Superior, inhabited by dwarfs, one-legged men, and other interesting specimens of humanity, not to mention four-footed creatures whose habits were, to say the least, extraordinary. But what fired the imagination of young La Vérendrye more than anything else was the report that this western country was watered by a mighty river that flowed into the Western Sea—the discovery of which would bring glory to any ambitious son of New France.

He determined to devote his life to western exploration. For some years, however, circumstances stood in the way. Finally he succeeded in interesting the governor De Beauharnois in his project, and what was perhaps more important, induced some

of the merchants of Montreal to equip him with trading goods and provisions for his expedition. The plan was to penetrate to Lake Winnipeg, then vaguely known through reports of the Indians, and establish a trading post there, as well as on Rainy lake and Lake of the Woods. This would give him a secure foothold in the western country, and enable him to mature his plans for a dash to the Western Sea, believed to be at no great distance from Lake Winnipeg. Incidentally he was to induce the western tribes to bring their furs to his posts and trade them for goods carried up from Montreal; instead of taking them down to the English on Hudson Bay. Most of the profits of the venture were to go to the Montreal merchants, although La Vérendrye had himself sunk in it all his personal fortune.

The general outlines of the expedition will be familiar to all readers of Francis Parkman. Miss Agnes Laut has also told the story, in her own delightful way, in "Pathfinders of the West." Nothing could be more truly heroic than the way in which this Canadian explorer stuck to his great project in spite of difficulties and disasters that would have broken the heart of any ordinary man. Three sons and a nephew, La Jemeraye, accompanied him into the west. The hardships of the undertaking killed La Jemeraye, and one of the sons was murdered by the Sioux on the Lake of the Woods. Yet La Vérendrye never dreamed of abandoning his task. With his two remaining sons he pushed on, determined to win at all hazards. Precious time was lost in working up the fur-trade, to satisfy the clamorous creditors at Montreal, and all the thanks he got was the charge that his exploration was a mere pretext; that he was secretly enriching himself at the expense of the merchants who had help to equip him for the expedition. He had sent them down several rich cargoes of furs; they had absorbed all the profits of the posts and left him worse than penniless; yet they threatened him with a lawsuit—because they had counted on a hundred per cent. profit and got only fifty. "In spite of the derangement of my affairs," he writes, with pardonable bitterness, "the envy and jealousy of various persons impelled them to write letters to the Court insinuating that I thought of nothing but making my fortune. If more than forty thousand livres of debt are an advantage, then I can flatter myself that I am rich indeed."

From Lake Winnipeg, he and his sons ascended the Red river to the mouth of the Assiniboine, where they built Fort

Rouge, (a suburb of Winnipeg covers the spot where the old fort stood), and then paddled up the Assiniboine to the present site of Portage la Prairie, where they established Fort La Reine. From here they travelled overland to the Mandan villages on the Missouri. La Vérendrye's account of this first meeting of white men with one of the most remarkable of the western tribes is interesting and valuable. It gives one an idea of Indian civilization—if one may use the term—developed without any help from the knowledge and experience of white men.

When they were yet some way from the Missouri they were met by a Mandan chief with thirty warriors, who presented La Vérendrye with corn in the ear and native tobacco, emblems of peace and friendship. As they neared the villages, La Vérendrye, with that shrewd knowledge of Indian character which always stood the French in such good stead, prepared his men for a spectacular entry. Donning all their finery they marched along the banks of the Missouri in military order, with the fleur-de-lys borne proudly in front, and as they reached the first huts of the village they halted and fired three blank salutes with all the available muskets. The Mandans crowded out to meet them, and as La Vérendrye and his men marched down the broad street to the lodge of the head chief, the walls of the village and the tops of the curious dome-shaped houses were crowded with curious women and children. The Mandans, unlike other tribes of the west, not only lived in permanent villages, but grew their own corn, pumpkins, and other vegetables, as well as native tobacco. As compared with their neighbours they had reached a high degree of civilization, although up to the time of La Vérendrye's visit they had had no relations whatever with white men. Many years later Prince Maximilian visited the Mandans, and although he knew nothing of the French explorer's journey, his minute description of their manners and customs is almost identical with La Vérendrye's. I have here a number of reproductions of scenes in and about the Mandan villages, drawn by Bodmer, who accompanied Maximilian.

The explorers returned from the Mandan villages in midwinter across the open prairie, exposed to fierce and biting winds. La Vérendrye had been taken ill on the eve of their departure, but insisted on going forward. They had no fuel, very little food, and were compelled to camp night after night on the open prairie without shelter of any kind. Cold, hungry and dispirited,

the men would many times have turned back if La Vérendrye had let them. He alone was determined to push on. With grim, pain-wracked face and shaking limbs he urged them forward. The indomitable spirit of the man rose superior to all physical pain. After suffering almost incredible hardships they reached their fort on the Assiniboine, more dead than alive.

At the Mandan villages the explorer had learned of a tribe whose home was far to the westward, and who were said to have visited the Western Sea. It was determined to secure one or two of them as guides, and push forward again toward the great gaol. La Vérendrye had suffered severly from the effects of the Mandan journey and was in no shape to lead an expedition through an unknown country, but his sons were ready and willing to take his place. Crossing the Missouri, they travelled from tribe to tribe toward the south-west until finally they reached the eastern slope of the Rocky Mountains. They were then with a party of Crow Indians. Between them and the mountains lay the blood-thirsty Snakes—a tribe who seem, like the Sioux of the middle west, and the Iroquois of the east, to have waged a perpetual warfare against all the surrounding tribes. Before them lay the mountains, beyond whose tantalizing summits they were persuaded lay the Western Sea. Yet there was nothing for it but to turn back. The situation was exasperating; but it would be madness to venture among the Snakes, who would as soon scalp a French explorer as an Indian. Reluctantly turning to the east again they made their way back to Fort La Reine, which they reached after an absence of about twelve months.

The La Vérendryes now turned their attention to a more northerly route, and established two trading posts on the Saskatchewan. The father went down to Montreal to make his peace with the merchants and obtain necessary supplies for another attempt, but his appeals fell upon deaf years. The King had authorized him to continue his explorations, but would contribute nothing toward the expense. The merchants were interested in nothing but the profits of the fur-trade. He lingered on month after month, and finally managed to scrape together enough to meet his more urgent needs. He had just about completed his preparations for returning to the west, when he was taken ill, and died. In the last letter he wrote to the Colonial Minister in Paris, shortly before his death, he outlined his plans for completing his exploration. "I shall be most

happy," he concluded, "if as the outcome of all the trials, fatigues and risks I have undergone in this protracted exploration, I could succeed in proving to you my unselfishness, my great ambition, as well as that of my children, for the glory of the King and the welfare of the Colony." Yet this man had for years been subjected to the grossest calumny by those who lacked both the physical and moral courage to match his achievements.

The death of La Vérendrye's son Jean has been mentioned. Let me tell the story, as well as I can, as an illustration of the perils the early fur-traders were called upon to face.

La Vérendrye had gone down to Montreal with a cargo of furs, and upon his return, hurrying forward in a light canoe, he found the little garrison at Fort St. Charles at the point of starvation. The supplies were still some way behind, and it was decided to send a party down to meet them at Kaministikwia and hurry back at utmost speed with what was most urgently required. Jean, now twenty-three years of age, was put in charge, and with him went the Jesuit Father Aulneau, on his way down to Montreal.

Jean and his men were to make an early start the following morning, and everything was prepared so that there might be no delay.

The sun had hardly risen above the horizon, and was yet filtering through the dense foliage of pine and cedar, when the party embarked and pushed off from the shore. Paddles dipped noiselessly, and the three light canoes skimmed like birds over the surface of the Lake of the Woods, followed by shouts of farewell from the fort.

For a time they skirted the shore, then struck out boldly across the lake, the multitudinous melodies of the forest blending, following them for a time, and then dying away in the distance. Nothing was now to be heard but the dip of paddles and the soft swirl of eddies flying backward from either side of the canoes. The morning sun swept across the lake; a faint breeze rose and lifted the water into a rippling surface of molten silver. Fishes flashed hither and thither, intent upon their morning meal. From far away came faintly the laugh of a solitary loon. The men paddled strenuously, with minds intent upon nothing more serious than the halt for breakfast. The priest was lost in meditation. Young La Vérendrye sat in the foremost canoe,

with eyes alert scanning the horizon. The little flotilla drew rapidly across the lake.

At the same time there was approaching from the opposite direction a fleet of canoes manned by a hundred or more savages—fierce and implacable Sioux of the Prairie. They were nearing the Lake of the Woods by way of a stream which bore the significant name, *The Road of War*. This was the war-path of the Sioux from their own country to that of the Christinaux and Assiniboins. When they followed it they were upon no peaceful errand.

As the flotilla entered the lake a mist was slowly rising from the water, but before it completely enshrouded them a keen-sighted savage discovered the three canoes of the French about to land on the far side of an island out in the lake. Cautiously the Sioux felt their way across, and landed unperceived. They glided noiselessly through the thick underbrush, and as they approached the other side, crept from tree to tree, finally wriggling snake-wise to the very edge of the thicket.

Beneath lay a narrow beach, on which some of the voyageurs had built a fire and were preparing the morning meal. Others lay about, smoking and chatting idly. La Vérendrye sat a little apart, perhaps recording the scanty particulars of the journey. The Jesuit walked up and down, deep in his breviary.

The circumstances could hardly have been more favorable for a sudden attack. The French had laid aside their weapons, or left them in the canoes. They had no reason to expect an attack. They were at peace with the western tribes—even with those Ishmaelites of the prairie, the Sioux.

Presently a twig snapped under the foot of a savage. La Vérendrye turned quickly, caught sight of a waving plume, and shouted to his men. The war-whoop rang out immediately from a hundred fierce throats. The Sioux leaped to their feet. Arrows showered down upon the French. La Vérendrye, Aulneau, and a dozen voyageurs fell. The rest snatched up their guns and fired. Several of the Sioux, who had incautiously left cover, fell; but the odds were now overwhelmingly against the French. They must fight in the open, while the Indians remained comparatively secure among the trees. An attempt was made to reach the canoes, but had to be abandoned. The Sioux completely commanded the approach, and no man could reach the

water alive. The remaining French, now reduced to half a dozen, retreated down the shore. With yells of triumph the Sioux followed, keeping within shelter of the trees. In desperation the voyageurs dropped their guns and took to the water, hoping to reach a neighbouring island. Wounded and exhausted, they were attempting the impossible. The Sioux rushed to the shore, but realizing the plight of the French, did not waste an arrow on them. One by one the swimmers sank beneath the waves; and the savages returned to scalp those who had fallen at the camp. With characteristic ferocity they hacked and mutilated the bodies, and then gathering up their own dead, hastily retreated by the way they had come.

Let us turn back now, nearly a hundred years, to the foundation of the Hudson's Bay Company.

At the corner of Lime and Leadenhall streets, in the heart of the World's Metropolis, there stands to-day a building—venerable as we count time on this continent, though a mere thing of yesterday when compared with scores of other famous buildings in that great city. This is Hudson's Bay House, the home of the greatest of all fur-trading companies. For two hundred and thirty-seven years the history of the Hudson's Bay Company has been part and parcel of the history of British North America; part and parcel of the history of this land of magnificent proportions and boundless resources. The Hudson's Bay Company has been severely and justly criticised in the past, for its selfish, dog-in-the-manger policy. Yet it may well be that we have to thank the Hudson's Bay Company, to some extent, for our present possession of a country washed by three oceans; though we owe an even deeper debt of gratitude to our own North West Company. It was not the fault of the North West Company that the international boundary robs Canada of half the western wheat belt, as well as of the rich valley of the Columbia. The men of this plucky Canadian company were trading on the banks of the Missouri years before Lewis and Clark explored the river for the United States government. When Astoria was built in 1810—by Canadians—at the mouth of the Columbia, the North West Company was already established on its upper waters. The Canadians came down the river —and Astoria became Fort George. From the mouth of the Columbia to the limits of Russian America, the North West Company held undisputed sway. Nevertheless, the British

Government limply abandoned Oregon to the Americans. You remember the story that Butler tells in his "Wild North Land": "It is said that once upon a time a certain British nobleman anchored his ship-of-war in the deep waters of Puget Sound. It was at a time when discussion was ripe upon the question of disputed ownership in Oregon, and this ship was sent out for the protection of British interests on the shores of the North Pacific. She bore an ill-fated name for British diplomacy. She was called the "America."

"The commander of the 'America' was fond of salmon fishing; the waters of Oregon were said to be stocked with salmon; the fishing would be excellent. The mighty 'Ekewan,' monarch of salmon, would fall a victim to flies, long famous on waters of Tweed or Tay. Alas, for the perverseness of Pacific salmon. No cunningly twisted hackle, no deftly turned wing of mallard, summer duck, or jungle cock, would tempt the blue and silver monsters of the Columbia or the Cowlitz rivers. In despair, his lordship reeled up his line, took to pieces his rod, and wrote in disgust to his brother (a prominent statesman of the day) that the whole country was not worth a ———.

Butler does not vouch for the truth of the story. Neither do I. Nevertheless no Canadian ever attacked the policy of the Imperial Government touching the international boundary so severely as this British Officer. In any event, the United States got Oregon—to the triumph of British diplomacy! But this is a far cry from the Hudson's Bay Company, and its eminently respectable headquarters at the corner of Lime and Leadenhall streets.

In the archives at Hudson's Bay House is preserved one of the most remarkable collections of manuscripts in the world. In its way it is absolutely unique. It is the documentary history of the company from the days of that picturesque scoundrel Prince Rupert, to the present day. Piled upon shelves, literally from floor to ceiling, lie thousands of manuscript journals, covering more than two centuries of the fur-trade. Faded, and blurred, and battered; written upon every description of writing material, in the varying language of the seventeenth, eighteenth and nineteenth centuries, these journals represent the life-histories of an army of adventurers; generation after generation of them, all in the service of the same great company. One can almost read the history of the fur-trade on their outer wrappers. Here

are the earlier ones, faded with age, but showing no signs of rough usage. They are dated from Prince of Wales Fort, or Fort Nelson (afterward York Factory), or one of the forts on James Bay. They represent the long period of inactivity, when the Hudson's Bay Company slumbered peacefully on the shores of the bay, hugging its benevolent monopoly, not even dreaming of the rude awakening that was to come from the south. But here is a change. The journal is dated from Cumberland House, on the Saskatchewan; the handwriting is vigorous, wide-awake; the old company has at last been driven inland to fight for its very existence with the enterprising traders from Montreal, whom it had lately branded contemptuously as "peddlars," but now recognized as formidable rivals. And here, of later date, are scores of journals, battered and weather-beaten from their long journeys by dog-sled or canoe or York boat from Chipewyan or Dunvegan or Alexandria, Norman or Good Hope, Langley, St. James or Simpson; from New Caledonia or the far-off valley of the Mackenzie. They are grimed with the smoke of a hundred camp-fires; blurred with the spray of many rivers. Between the faded lines one may read the tragedies, comedies, romances of the western fur-trade; of that life which in spite of its bitter hardships held many attractions for a vigorous race of men. What a rich mine these human documents offer to the historian, the novelist, the ethnologist, the student of mankind in the rough.

The origin of the Hudson's Bay Company was as romantic as anyone could desire. Curiously enough the fathers of this essentially British institution were a couple of French adventurers from Canada: Pierre Esprit Radisson, and his brother-in-law, Medard Chouart, commonly called Groseilliers. The extraordinary history of these extraordinary men is told in Radisson's own journals, edited some years ago by the Prince Society of Boston. The original narratives, or what are supposed to be the original narratives, are now in the British Museum and the Bodleian Library.

Radisson made four journeys, or voyages as he calls them; the first two from the St. Lawrence to the Iroquois country; the third and fourth—I am getting on dangerous historic ground here, for a war of controversy has been raging for years around these two latter journeys of Radisson. It is asserted, and denied, that on his third journey he discovered the Mississippi. It is asserted, and denied even more fiercely, that on his fourth journey

he reached James Bay overland from Lake Superior. At any rate, upon the return of Radisson and Chouart from their fourth journey, having failed to interest the French authorities in their plans for cornering the western fur-trade, they tried New England, and failing there also, they sailed for England, where King Charles listened with interest to the romantic tales of these picturesque adventurers.

Radisson laid before him an ambitious scheme for an expedition to Hudson's Bay, with the promise of a rich harvest of peltries. King Charles liked the idea, but he had been drawing pretty heavily upon both the public and privy purse about that time, and there was nothing left for Radisson. He s[illegible]t for his cousin Rupert, however, and between them they [illegible]naged to secure enough from the London merchants to e[illegible] a couple of small ships, the Nonsuch and the Eaglet. I[illegible]ne, 1668, the two vessels sailed out of the Thames for L[illegible]son's Bay, discovered about half a century before by Hudson. Radisson sailed in the Eaglet, and Chouart in the Nonsuch. The Eaglet was driven back by rough weather, but Chouart, with Captain Gillam, weathered the storm, and reached the bottom of James Bay about the end of September. They landed, not far from the spot where the ill-fated Hudson had wintered in 1610, and built a rough log house at the mouth of a river which they named after their patron, Prince Rupert. The fort—the first trading establishment on the bay—was named after King Charles. Here they spent the winter, trading with the natives, and the following year returned with a very fair cargo of furs. Out of this small venture grew the mighty Hudson's Bay Company, for Rupert and his associates were so delighted with the results of the voyage that they persuaded King Charles to grant them a royal charter, incorporating them as "The Governor and Company of Adventurers of England trading into Hudson's Bay." Dr. Bryce speaks of the "unrestrained heartiness" of King Charles in the opening phrases of the charter. King Charles' "unrestrained heartiness" runs all through this remarkable document. There was very little in heaven and earth that the good king did not bestow thereby upon "our dear entirely beloved Prince Rupert," and the rest of the Gentleman Adventurers.

There was but one implied obligation in the charter, and that was that the Company was to continue the search, begun by Hudson and continued by Button, Foxe, James and other

British navigators, for a passage into the South Sea by way of Hudson Bay. The company pondered over its bargain for a hundred years, and then sent Samuel Hearne, inland from Fort Prince of Wales, to hunt for the passage, and incidentally look for copper mines, and drum up trade. Nothing in the history of exploration is more fascinating than Hearne's account of his journey to the Coppermine river. It left the North West Passage still more or less of an open question; it brought no copper, and not much in the way of trade, to the company; but it stands out as one of the most splendid achievements in the whole history of inland exploration. By sheer, dogged pluck this young Englishman ma[illegible] his way, over an immense and very difficult country, and thr[illegible] obstacles of every kind, to the shores of the Arctic sea. His [illegible]scription of the massacre of the Eskimos by the Chipewya[illegible] near the mouth of the Coppermine, is as vividly realistic a[illegible]ything in fiction.

The Chipewyans made their preparations with the utmost deliberation. When their scouts came in with news that they had discovered an Eskimo village, they stripped, put on war-paint, armed themselves with spears and shields, and before daylight were within reach of the village. Everything favoured the Indians. The unfortunate Eskimos were surprised in their sleep. Men, women and children, in all upwards of twenty, they ran out of their tents stark naked, and rushed wildly about, only to find every avenue of escape cut off. With cold-blooded deliberation they massacred them. Hearne had been forced to accompany the war party. To his horror he saw a young girl murdered at his very feet; so close that when the first spear was thrust into her side she fell down at his feet, writhing round his legs, piteously begging his protection. He pleaded with the Chipewyans to spare her, but they laughed at his horror-stricken face, asking him contemptuously, as they transfixed the girl's body to the ground with their spears, if he wanted an Eskimo wife. Hearne says that he could hardly restrain his tears at the hideous cruelty of the scene, and his utter inability to prevent it. The place has ever since been known as Bloody Fall.

Throughout the narrative we hear a good deal of Hearne's Chipewyan guide, Matonabbee, who seems to have been a man of somewhat remarkable character. One cannot readily forget his advice to Hearne not to dream of attempting such a long and difficult journey without women. Women, said this graceless

philosopher, were invaluable in the wilderness. They were made for labour; they would carry all the bundles; and, he added triumphantly, "though they do everything, they are maintained at a very trifling expense, for as they always stand cook, the very licking of their fingers in scarce times is sufficient for their subsistence.'

After his return from the Coppermine, Hearne journeyed inland again, but in a different direction. His destination was now the Saskatchewan, where, on the borders of Cumberland lake, he built Cumberland House. He could not have chosen a better spot, in the interests of his company. The fort commanded the main thoroughfare from Lake Winnipeg to the mountains, as well as from the Saskatchewan north to the Churchill. It was the first really effective reply to the bold challenge of the North West Company.

The Canadians joyfully responded. They had already anticipated Hearne's shrewd move to some extent by establishing themselves at Portage de Traitte (Frog Portage) on the Churchill. They now pushed on up the Churchill to Ile à la Crosse lake, where they built a post and intercepted the western Indians on their way down to the Hudson's Bay Company's factories on the bay. So the trade war went merrily on from year to year, sometimes the Hudson's Bay men getting the advantage; oftener the Nor'-Westers. The latter nearly always led the way, in characteristically impetuous fashion; the Hudson's Bay Company following at a more leisurely, dignified pace. It was so everywhere in the west, or nearly everywhere. It is true a Hudson's Bay man, Anthony Hendry, reached the Saskatchewan from the bay some years before the first traders from Montreal; but beyond this the North West Company took the lead. They were first on the Athabaska; first on the Peace; first on the Mackenzie; first over the mountains; first to the Pacific. But with dogged perseverance the men from the bay followed after, running their boats ashore wherever they found a North West post, and building one beside it. Sometimes there were three rival establishments within hailing distance, for the X Y Company, a younger brother of the North West Company, followed the same tactics.

Despite trade rivalry the traders of the several companies got on fairly well together. They dined at each others houses. The rival brigades of canoes or boats often travelled down to-

gether from the far west to Lake Winnipeg, where the Hudson's Bay people turned north to York Factory, while the Nor'-Westers and X Y's turned south to Grand Portage or Fort William. Sometimes one would steal a march on the other. The story is told of one enterprising trader who, learning of the approach of a party of Indians with a lot of valuable furs, invited his unsuspicious rivals to a dance. When the dance was at full swing, and the fiddles scraping furiously, the master with two or three trusted men slipped out without attracting notice. Harnessing dogs to their sleds they set off for the Indian camp, where they drove a vigorous trade. The next morning the rivals, hearing at last of the Indian visitors, and knowing nothing of the way they had been hoodwinked, set off for the camp—only to meet the others half way, returning with sleds heavily laden with bales of furs.

But the war of the companies did not always run so peaceably by any means. There were quarrels and hand-to-hand fights; plundering of rival brigades, and burning of rival trading posts. At some of the forts hired ruffians were maintained to bully the men of the rival camp. Everywhere and always the conflict was disastrous to the Indians. Left to themselves the fur companies used liquor very sparingly in their relations with the Indians. But when the rivalry grew fierce, all sense of decency or humanity was abandoned, and the traders outvied each other in debauching the natives with cheap rum. The conflict between the X Y's and the North West Company finally culminated in a cold-blooded murder. The news was carried down to the rival headquarters at Grand Portage, with the result that the horrified partners of the two companies got together and agreed to pool their interests. Many years afterward, the bitter hostility of the North West and Hudson's Bay Companies brought about a similar union, and the combined interests, retaining the name of the older company, held thereafter a monopoly of the fur-trade of half a continent.

It has generally been assumed, upon the strength of Mackenzie's statements in his General History of the Fur-Trade, that the first English trader from Canada who penetrated to the Saskatchewan was Thomas Curry, and that he was followed the next season by James Finlay. Mackenzie is not very clear as to dates, but apparently Curry's journey was made in 1768-9, and Finlay's in 1769-70. Mackenzie was somewhat astray,

and curiously enough the evidence comes from one of the rival Hudson's Bay journals. In the Archives is a copy of a journal of one Matthew Cocking, who made a journey from York Factory to the Saskatchewan country in 1772. He says that, somewhere below the Forks of the Saskatchewan, he passed an old trading post, where "one Mr. Finley from Montreal resided five years ago," that is, in 1767. Elsewhere he says, "the Pedlar, Mr. Currie (who intercepted great part of York Fort trade this year) is one day's paddling below this river, at Cedar Lake." James Finlay, therefore, would appear to have been the first English trader from Montreal to ascend the Saskatchewan, not Thomas Curry, and the journey must have been made not later than 1767, if Cocking's statements are to be believed.

Cocking was himself preceded by an earlier trader from the bay—Anthony Hendry. Hendry's journal is both interesting and valuable. He left York Factory in June, 1754, and reached the Saskatchewan a month later. At a place now known as The Pas, he came to a French trading post, and as this is the only known case of English and French traders meeting in the North-west, Hendry's account is worth quoting. "On our arrival," he says, "two Frenchmen came to the water-side, and in a very genteel manner invited me into their house, which I readily accepted. One of them asked me if I had any letter from my master, and where, and on what design I was going inland. I answered I had no letter, and that I was sent to view the country, and intended to return in the spring. He told me the master and men (the master was no doubt La Corne, who was in charge of the French posts on the Saskatchewan at that time) were gone down to Montreal with the furs, and that they must detain me till their return. However they were very kind." Hendry, who was young and inexperienced, repeated the conversation to his Indian guide, Attickashish, who smiled and assured him that the French traders dare not detain him. The following day Hendry breakfasted and dined with the French, made them a present of tobacco, for which they seemed exceedingly grateful, and continued his journey.

Leaving the Saskatchewan, Hendry with his Indians marched overland to the south-west; crossed the South Saskatchewan; reached the North Saskatchewan near the present town of Battleford; and then struck off to the south-west across the Great Plain, reaching the Red Deer in October.

Crossing the Red Deer, Hendry came to a camp of the Blackfeet, where he was royally entertained. The great Chief of the Blackfeet received him in his own lodge, large enough to contain fifty persons. The Chief was seated on a sacred white buffalo skin, and surrounded by twenty elders. He made signs for Hendry to sit down upon his right hand. The calumet was produced and passed around in solemn silence. Then boiled buffalo was served in wicker baskets. Hendry, through his interpreter, urged the Chief to send his young men down to the bay to trade their beaver skins for guns and ammunition, cloth, beads, etc. The Chief listened politely, but did not seem greatly impressed. The way was long, he said, and his young men knew not the use of the paddle. They were men of the plains. Why should they journey so far to obtain things that they did not need? The plains provided them with food and clothing. They followed the buffalo from place to place, and killed what they needed. Bows and arrows answered all their purposes. They did not need guns. "Such remarks," says the candid Hendry, "I thought exceeding true." He made the Chief a present of various articles that he had brought with him for the purpose, and they parted and went their several ways.

On his return to the Saskatchewan, Hendry again visited the French fort at The Pas, of which he gives a detailed description. La Corne had returned in the interval, and entertained him courteously. Hendry was particularly pleased with the French canoes. "They will carry," he says, "as much as an India ship's long-boat, and draw little water; and so light that two men can carry one several miles with ease." He was impressed with the remarkable influence the French exercised over the Indians. "They have," he admits frankly, "the advantage of us in every shape, and if they had Brazile tobacco, which they have not, would entirely cut off our trade."

It was in keeping with the general sluggishness of the Hudson's Bay Company that, in spite of this notable journey of Hendry's, and the later expedition of Matthew Cocking, they should have permitted the North West Company to secure a firm footing in the west before they attempted to make anything like a permanent settlement in the interior. They had grown so accustomed to their comfortable forts on the bay, to which the tribes brought down their bundles of furs from every quarter of the west, that it needed the rudest kind of an awakening to

force them to move inland and face the unpleasantly novel competition of the Montreal traders.

The first of the latter who left any record of his life in the west was Alexander Henry. There were three of that name connected with the fur-trade: Alexander Henry, the elder; his son, and his nephew. The elder Henry published an account of his experiences in the west in 1807. The voluminous manuscript journals of Alexander Henry, nephew of the one first mentioned, are in the Library of Parliament. They have been edited, in connection with the even more voluminous journals of David Thompson, by the late Dr. Elliott Coues. The son of the first Henry—also named Alexander—did not fill so important a place in the western fur-trade as his father and cousin.

A brief account of his tragic end in the far North-West is given in Masson's "Bourgeois de la Compagnie du Nord-Ouest," in a letter from George Keith who writes: "Sorry I am to add that the late Mr. Alexander Henry with four men and some women and children suffered an untimely and barbarous fate, all having been most cruelly murdered by a strong party of natives of that post (Fort Nelson, Liard River)."

The elder Henry left Montreal for the west in August, 1761, and reached Michilimakinac the following month. We find in his narrative what is probably the best available account of the fur-trade; at least as it was in his day. Dr. Bain justly praises Henry's "clear, simple, Defoe-like style." The story of his adventurous life in the great west is, indeed, as fascinating as any romance.

Henry travelled, as all the Montreal traders did, French and English, in a birch-bark canoe. These canoes were five and a half fathoms, or thirty-three feet in length, and four and a half feet wide at the broadest part. To each canoe there were eight men, and to every three or four canoes, constituting a brigade, a guide was assigned. The most skilful *voyageurs* took the bow and stern of the canoes, and earned double the wages of the middle-men. Such a canoe carried, in addition to its crew sixty packages of merchandise; weighing ninety to a hundred pounds each, and provisions to the extent of a thousand pounds; as well as the men's personal baggage; making a total load of about four tons—in a birch-bark canoe!

At Ste. Anne's, where Tom Moore many years afterwards wrote his famous "Canadian Boat Song," Henry's boatmen

landed and offered their vows, according to custom, for a successful voyage. This duty performed, they demanded, also according to custom, the distribution of eight gallons of rum to each canoe; nominally for consumption during the voyage, but as Henry dryly remarks, it was none the less according to custom to drink the whole upon the spot.

The following night they camped at the foot of the Long Sault—the scene of that splendid piece of heroism the story of which has been so admirably told by Mr. T. G. Marquis, in his "Stories of New France." The long Sault involved three portages, where everything had to be taken out of the canoes and carried overland to the navigable water above. The loads carried by these tough, wiry *voyageurs* seem almost incredible. Over a rough portage, anywhere from a few yards to a mile or more in length, they would carry not one but two and even three packs, each of a hundred pounds. After a smoke at the head of the portage, they would return for another load, and so on until everything had been taken to the head of the rapid. Then embarking, they would push out into the stream and strike up one of those inimitable chansons of old Canada—perhaps "A la Claire Fontaine," or "Gai le rosier." We hear a good deal, in the narratives of western explorers, travellers and fur-traders, of the faults of the French-Canadian *voyageur*, but even his severest critics have been forced to bear testimony to his cheerfulness under the most trying conditions. The man who could break into a rollicking folk-song, at the end of a series of difficult portages, under a broiling sun, and in the midst of a cloud of mosquitoes, should surely be forgiven a catalogue of sins.

Fourteen leagues above the Long Sault, Henry came to a deserted French trading-post, surrounded by a stockade. Later in the day he reached the river below us. His description of the Rideau and Chaudière as they appeared a century and a half ago, is worth repeating. "On the south bank," he says, "is the mouth of a river four hundred yards wide, and which falls into the Outaouais perpendicularly, from the edge of a rock, forty feet high. The appearance of this fall has procured for it the name of the *rideau*, or *curtain*; and hence the river itself is called the Rideau, or *Rivière du Rideau*. The fall presented itself to my view with extraordinary beauty and magnificence, and decorated with a variety of colours."

"Still ascending the Outaouais," he continues, "at three

leagues from the fall of the Rideau is that of La Grande Chaudière, a phenomenon of a different aspect. Here, on the north side of the river, is a deep chasm running across the channel for about two hundred yards, from twenty-five to thirty feet in depth, and without apparent outlet. In this receptacle, a large portion of the river falls perpendicularly, with a loud noise, and amid a cloud of spray and vapour; but embellished from time to time with the bright and gorgeous rainbow. . . Above (the fall) there are several islands, of which the land is higher at the upper than at the lower extremities. The carrying-place is not more than a quarter of a mile in length, over a smooth rock, and so near the fall that the men in passing are wetted by the spray." Henry also mentions the upper Chaudière, or Des Chênes rapids, and supplies the interesting bit of information that they were named from the oak trees which in his day abounded along the banks.

He followed the usual route by way of Lake Nipissing, French river, and Lake Huron, to Michilimakinac. All the way up the Indians warned him that he was going to certain death, as the tribes about Michilimakinac were loyal to the French and would not tolerate an Englishman. Nevertheless he determined to go on at all hazards. He had hardly settled down at Michilimakinac when a band of sixty Chipeways, headed by their chief Minavavana, marched in upon him, each with his tomahawk in one hand and scalping-knife in the other. Their faces were painted with charcoal, worked up with grease; their bodies with white clay, in patterns of various fancies. Altogether they must have presented a sufficiently alarming appearance. At a sign from the chief they seated themselves on the floor, and Minavavana, after complimenting Henry upon his bravery in thus coming fearlessly among his enemies, proceeded to deliver an impassioned address in which he proclaimed his loyalty to the French King, but wound up by an intimation that although many of his tribe had been slain by the English, their spirits might be satisfied by a suitable present. This solution of the difficulty relieved Henry's mind. After the ceremonial pipe had been passed around, Minavavana requested that his young men might be allowed to taste what he called *English milk* (otherwise rum) observing that it was a long time since they had tasted any, and that they were anxious to know whether there was any d fference between the English milk and the French.

Henry remained in the neighbourhood of Michilimakinac until the summer of 1763, an English garrison having in the meantime taken possession of the fort. There had been rumors from time to time of a plot among the Indians to massacre the garrison, but the commandant laughed at the idea, and no precautions were taken. Finally, through the ruse of a lacrosse match, the fort was surprised, and before the English could arm themselves they were cut down. By marvellous good luck, Henry managed to escape. Parkman has told the story in his own inimitable way, having obtained the facts from Henry's narrative, but I doubt if anything can be more graphic and exciting than Henry's own story.

After trading about Lake Superior for twelve years, Henry determined to strike out boldly into the great North-West. Leaving Sault Ste. Marie with goods and provisions to the value of three thousand pounds sterling, on board twelve small canoes and four larger ones, he coasted around the north shore of Lake Superior, and in eighteen days reached Grand Portage. It took seven days of severe labor to get the goods over this long and dangerous carrying-place, and this was but the beginning of an almost constant series of portages until he reached Rainy Lake. From there he followed the usual route by way of Rainy river, Lake of the Woods and Winnipeg river, to Lake Winnipeg. Coasting up the east side of the lake, he was overtaken by one of the most celebrated of the western traders, Peter Pond, and a few days later two brothers, Joseph and Thomas Frobisher, also joined the party. They were now one hundred and thirty men, in an imposing fleet of thirty canoes.

Ascending Grand Rapids and crossing Cedar Lake, they finally reached the main waters of the Saskatchewan, and paddled up stream to Pasquayah village. The place is now known as The Pas. On their arrival the Cree chief, Chatique, came down to the river's edge to meet them, attended by thirty followers, armed with bows and arrows and spears. Chatique was a man of over six feet, somewhat corpulent, and, as Henry significantly observes, of a very doubtful physiognomy. He invited the traders to his tent, and it was observed that he seemed particularly anxious to bestow his hospitalities upon those who were the owners of the goods.

Having brought Henry and his fellow-traders inside, where they were surrounded by armed natives, Chatique proceeded to

deliver an impromptu address which in its way was a masterpiece. He told them that he and his young men had long been in want of many things which he saw the traders possessed in abundance; he reminded them that he had them in his power, and that even if they escaped now he would catch them on their way down; and that, under all the circumstances, generosity would be their best policy. To avoid any misunderstanding he mentioned what the presents should consist of: three casks of gunpowder; four bags of shot and ball; two bales of tobacco; three kegs of rum; three guns; together with knives, flints and other trifles. He was, he said, a peaceable man, and one that contented himself with moderate views—in order to avoid quarrels; but they must agree to his suggestion before they left their seats. After a hasty consultation the traders promised to comply. There was really nothing else to be done, for the worthy Chatique had them absolutely cornered. Having gracefully accepted their "presents," this gentlemanly river baron conducted them to their canoes, and wished them a pleasant voyage. Of Henry's subsequent adventures in the west nothing need be said here.

Alexander Henry's nephew and namesake entered the west some time before the year 1799, following the usual route from Montreal to Grand Portage and Lake Winnipeg. His journals open in that year, at Rivière Terre Blanche, about forty miles west-north-west of Portage la Prairie. The following year he ascended Red River with the intention of building a trading post in the Sioux country—a very dangerous undertaking. One gathers from the narrative the wholesome dread in which this fierce and implacable tribe of the plains was held by both whites and Indians. As they ascend the river, Henry's men, anything but cowards in most things, become nervous and almost unmanageable. He has the utmost difficulty in preventing them from turning back. Scarcely a day passes but false alarms are raised; horsemen are seen far out on the plains, who resolve themselves into a herd of buffalo; foot-prints are discovered on the river's bank, which prove to be those of their own party; and so the story goes from day to day. Even when they have reached their destination, and are engaged in building their fort, the same deadly fear haunts the men—not an unmixed evil, as Henry viewed it. "Fear," he remarks, "is an excellent overseer, and the work went on with expedition." The men cared not how hard they worked, if they could only manage to get a stout wall between them and the devils of the plains.

They were in the heart of the buffalo country and therefore had no anxiety as to provisions. Henry's journal brings home to one the almost incredible numbers of the buffalo at the beginning of the last century. "The beach," he says, "once a soft black mud into which a man could sink knee-deep, is now made hard as pavement by the numerous herds coming to drink. The willows are entirely trampled and torn to pieces; even the bark of the smaller trees is rubbed off in places. The grass on the bank of the river is entirely worn away." Later he sees the buffalo moving slowly in one immense body, "commencing about half a mile from camp, whence the plain was covered on the west side of the river as far as the eye could reach. They were moving southward slowly, and *the meadow seemed as if in motion.*"

Horses had only recently been introduced in connection with the fur-trade, all the overland trade having hitherto been done on foot. They were now regarded as an indispensable part of the trader's equipment, somewhat to Henry's disgust, who believed that their introduction had made both his men and the Indians indolent, insolent and extravagant. To illustrate his argument he gives an amusing picture of the "bustle and noise which attended the transportation of *five pieces of goods*" to one of his branch establishments.

"Antoine Payet, guide and second in command, leads the van, with a cart drawn by two horses and loaded with his private baggage, cassetêtes, bags, kettles, etc. Madame Payet follows the cart with a child a year old on her back, very merry. Charles Bottineau, with two horses and a cart loaded with 1½ packs, his own baggage, and two young children, with kettles and other trash hanging on to it. Madame Bottineau with a squalling infant on her back, scolding and tossing it about. Joseph Dubord goes on foot, with his long pipestem and calumet in his hand; Madame Dubord follows on foot, carrying his tobacco pouch with a broad bead tail. Antoine Thellier, with a cart and two horses, loaded with 1½ packs of goods and Dubois' baggage. Antoine La Pointe with another cart and horses, loaded with two pieces of goods and with baggage belonging to Brisebois, Jasmin and Pouliot, and a kettle hung on each side. Auguste Brisebois follows with only his gun on his shoulder and a fresh-lighted pipe in his mouth. Michel Jasmin goes next, like Brisebois, with gun and pipe, puffing out clouds of smoke. Nicolas Pouliot, the greatest smoker in the North-West, has nothing but pipe and

pouch. Those three fellows, having taken a farewell dram and lighted fresh pipes, go on brisk and merry, playing numerous pranks. Domin Livernois, with a young mare, the property of Mr. Langlois, loaded with weeds for smoking, an old worsted bag (madame's property), some squashes and potatoes, a small keg of fresh water, and two young whelps howling. Next goes Livernois' young horse, drawing a travaille (that is, a couple of long poles with a cross-piece, dragging on the ground, very much like a pair of shafts without the waggon) loaded with his baggage and a large worsted mashguemcate (whatever that may be) belonging to Madame Langlois. Next appears Madame Cameron's mare kicking, rearing and snorting, hauling a travaille loaded with a bag of flour, cabbages, turnips, onions, a small keg of water, and a large kettle of broth. Michel Langlois, who is master of the band, now comes on leading a horse that draws a travaille nicely covered with a new painted tent, under which his daughter and Mrs. Cameron lie at full length, very sick; this covering or canopy has a pretty effect in the caravan, and appears at a great distance in the plains. Madame Langlois brings up the rear of the human beings, following the travaille with a slow step and melancholy air, attending to the wants of her daughter, who, notwithstanding her sickness, can find no other expressions of gratitude to her parents than by calling them dogs, fools, beasts, etc. The rear guard consists of a long train of twenty dogs, some for sleighs, some for game, and others of no use whatever, except to snarl and destroy meat. The total forms a procession nearly a mile long, and appears like a large band of Assiniboines."

A curiously vivid glimpse this into the lighter side of the life of the western fur-trader, whose very environment brought him so close to the simplicity and savagery amid which he moved. And the savagery is never far off. Brutality and murder become commonplace, and Henry gives little more weight to a shooting affray than he does to the fate of his kitchen garden; rather less, in fact, if only Indians are involved.

Note the grim humour of this paragraph, doubly grim because quite unconscious: "Le Boeuf stabbed his young wife in the arm, Little Shell almost beat his old mother's brains out with a club, and there was terrible fighting among them. I sowed garden seed." One has to read the unvarnished narratives of such men as Alexander Henry to realize the hideous brutality

of some phases of the fur-trade. "The seamy side of the fur-trade," says Dr. Coues, "is simply hell on earth—hell peopled with no souls above a beaver-skin, fired by King Alcohol for the worship of Mammon." As he says, there are passages in this very narrative which one can scarcely follow with unshaken nerves. The traders were not usually directly responsible; but often enough they were indirectly. Henry gives a horribly vivid description of the massacre by the Sioux of a party of Saulteurs, including his beau-père or father-in-law.

"My beau-père was the first man that fell," he says, "about eight o'clock in the morning. He had climbed a tree, to see if the buffalo were at hand, as they were tented there to make dried provisions. He had no sooner reached the top than two Sioux discoverers fired at the same moment, and both balls passed through his body. He had only time to call out to his family, who were in the tent about 100 paces from him, "Save yourselves! the Sioux are killing us!" and fell dead to the ground, his body breaking several branches of the tree as it dropped. The noise brought the Indians out of the tent; when perceiving their danger, the women and children instantly ran through the plains towards an island of wood on Tongue river, about a mile distant, and on a direct line toward the fort (the Pembina river post). The men took their arms and made off also, keeping in the rear of their women and children, whom they urged on. The four surviving men had not gone more than a quarter of a mile when they saw the main body of the war party on horseback rushing down upon them. Crossing Tongue river, and in a few moments coming up with them, the Sioux began to fire. The four men by expert manœuvres and incessant fire prevented the enemy from closing in them, while the women and children continued to fly, and the men followed. They were within about 200 paces of the wood and some of the most active had actually entered it, when the enemy surrounded and fell upon them. Three of the Saulteurs fled in different directions; Grande Gueule escaped before they were completely surrounded, but the other two were killed. The one who remained to protect the women and children was a brave fellow—Aceguemanche, or Little Chief; he waited deliberately until the enemy came very near, when he fired at one who appeared to be the chief, and knocked the Sioux from his horse. Three young girls and a boy were taken prisoners; the remainder were all murdered, and mutilated in a horrible

manner. Several women and children had escaped in the woods, where the enemy chased them on horseback; but the willows and brush were so intricate that every one of them escaped. A boy about twelve years old, whom a Sioux pursued, crawled into a hollow under a bunch of willows, which the horseman leaped over without perceiving him. One of the little girls who escaped tells a pitiful story of her mother who was killed. This woman, having two young children that could not walk fast enough, had taken one of them on her back and prevailed upon her sister-in-law to carry the other. But when they got near the woods and the enemy rushed upon them with hideous yells and war whoops, the young woman was so frightened that she threw down the child, and soon overtook the mother, who, observing that the child was missing, and hearing its screams, kissed her little daughter—the one who relates the story—saying, with tears streaming from her eyes; 'Take courage, my daughter! try to reach the woods—and if you do, go to your eldest sister, who will be kind to you; I must turn back and recover your younger sister, or die in the attempt—take courage—run fast, my daughter!' Poor woman! she actually did recover her child, and was running off with both children, when she was felled to the ground by a blow on the head with a war club. She recovered instantly, drew her knife, and plunged it into the neck of her murderer; but others coming up, she was dispatched."

Fortunately there is a brighter side to the picture, or it would be altogether repulsive. In spite of the difficulties of their position, and the evil influence of rival interests, many of the fur-traders not only treated the Indians justly and humanely, but made at least some effort to prove that the boasted civilization of the white men was more than skin deep, and that the contact of white man and red was not altogether detrimental to the latter.

"The True Story of the Encyclopaedia Britannica—the Ninth Edition."

By Professor Edward E. Prince, Dominion Commissioner of Fisheries.

[*Read Feb.* 15, 1907.

There is a true story of the last edition of the Encyclopædia Britannica. The fact that the prevalent one is erroneous prompts me to tell it especially as the views most widely current have not only in them an element of error, but of injustice which it is surprising to reflect no literary authority has attempted to correct. For the sake of conciseness I will refer to two gross errors which are widespread in reference to the Ninth Edition of the Encyclopædia. First, it is an error to regard the last edition as a new edition of an old and famous work—the successor simply of eight previous editions. Second, it is untrue to say that the work was begun by an editor, who transferred the laborious task to another, a young man, a distinguished scholar, a contributor indeed to the work, but one who, apart from some minor editorial assistance, shared no great responsibility, and practically saw merely the last few volumes through the press long after the Encyclopædia had been planned and completed. A Dundee journalist, stated to be the late Sir John Leng, who ought to have known the truth in that the real editor lived in St. Andrews, not more than ten or twelve miles distant, asserted that the Encyclopædia was begun by one editor, the late Professor Baynes, "and continued under the editorship of his Scottish colleague, Professor Robertson Smith." Quite recently I noticed in a well-known American journal the following reference, in an article on the late Professor Robertson Smith:—

"As editor of the 'Encyclopædia Britannica' he (Prof. Smith) appeared to his contributors to be an ideal director of such an undertaking. Although it was the conscientious labour that he expended upon the editing of the Encyclopædia that undoubtedly shortened his life, it was mainly his example and his influence

which brought that work up to the German standard of exact scholarship; and he will be remembered as editor of the ninth edition of the Britannica long after the echoes of the famous 'heresy' hunt have been buried in oblivion. A writer who wrote several articles for the Encyclopædia said of him after his death:— 'The range and exactness of his knowledge were such as, in the course of a life mostly spent at the Universities, I have never known equalled or even approached. The lightning rapidity and penetration of his mind which led him straight to the heart of a subject through a maze of bewildering details were also, in my experience, unparallelled, and did at least as much as his immense learning to fit him for carrying through the press a work which aims at being a clear and comprehensive summary of human knowledge.' "

Such grossly erroneous notices have, indeed, been scattered broadcast, and literary students everywhere will be willing that, if a true story exists, that story should be told, and honour given where honour is due. To the late Professor Spencer Baynes that honour is due. He had charge of the work, without editorial colleague until it was in every essential respect complete, and only failing health, due largely to the incessant labour of editing the gigantic Encyclopædia, threw the subordinate task upon Professor Smith of seeing the few last volumes through the press, correcting proof, etc., for Professor Baynes died early in 1887, and the last volumes were not issued until 1889. It is almost incredible that at a dinner, in the University of Cambridge, to celebrate the publication of the final volumes, while fulsome reference was made to Professor Robertson Smith (who had become a Professor in the University), scant allusion was made to the real creator and editor of the Encyclopædia.

A large company of contributors was assembled, but excepting a passing reference to Professor Baynes in the speech of Sir Michael Foster, who presided, there was little mention of the gifted creator of the great work. At the time I could not help recalling the scoffing tone in which a "don" once spoke to me of Professor Baynes, when I was in Cambridge—he said, "O! he's only the editor of the Encyclopædia, you know." In those same University precincts, some years later, Cambridge" dons" were quite anxious to claim for one of their Professors the credit of the editorship. That Professor Smith himself ever claimed the credit of editing the Encyclopædia has been affirmed by no one, so far

as I am aware. It was, however, claimed for him, and from two quarters, viz.: the academic, and the ecclesiastical. Possibly jealous of the little Scottish University, (whose Professor of Literature had accomplished so splendidly the gigantic task of editing a work declared by an American authority to be "the highest achievement of the English-speaking race in that field",) the English University men wished to transfer some of the lustre from the north, for Professor Smith, after he left the Scottish Free Church, became Librarian, and, later, Professor of Oriental Languages in Cambridge. But as he had been a clergyman in Scotland, and for some time Professor in a small theological college in Aberdeen, the Free Church did not resent the theory of his editorship. It is true that the Free Church expelled Robertson Smith for heresy, but the younger churchmen, especially, were not unwilling to regard him as the creator and moving power in the editorial sanctum of the Encyclopædia where his heresies were published.

I had the privilege of knowing the late Professor Baynes, not in a professional or even ordinary friendly way, but in the most intimate manner. I was a student of his for two years, and later his academic assistant, one of the last, if not the last he ever had. I have, thus, quite a personal interest in this true story. But more, I have the task of endeavoring to do some justice to the memory of a truly great man—one who was modest and unassuming, but richly gifted, a profound scholar, almost encyclopædic in the range of his knowledge, and widely beloved in literary and scientific circles—a man whose *magnum opus* all the world knows, but of the man himself knows little. The main facts of his life are soon told. He was born in Somersetshire, at Wellington, in 1823, and went to Edinburgh in 1845. Sir William Hamilton was reviving those studies in Logic and Metaphysics which had been for long despised and misunderstood as a vital part of academic training. He was, as Professor Veitch truly said, "the means of inspiring and impressing young minds—opening up to them new fields of thought and vision—giving principles and convictions which passed into their intellectual, moral, and religious life—to a degree and extent which has been very rarely equalled by an academic teacher." Under the spell of this great master in philosophy, Spencer Baynes became an enthusiastic toiler in the field of intellectual science. Early in his course he attracted the notice of Sir William, and the relation of student and pro-

fessor ripened into close personal friendship. Professor Baynes told in the "Edinburgh Essays" how the intimacy began:—

"One of the first evenings I ever spent with Sir William Hamilton was in the early weeks of session 1846-47. Sir W. Hamilton was accustomed to prescribe annually some standard work in philosophy to be read by candidates for honours in connection with the work of the class, and that year the 'De Anima' of Aristotle had been selected for this purpose. Soon after the commencement of the session, Sir William having intimated to the class that he would be glad to see any students who were reading the book, and answer any question they might wish to ask, I went to his room at the close of the lecture hour, mainly to inquire what edition he recommended for critical study." Sir William invited Professor Baynes to his house, where, after having engaged him in a long and interesting conversation, he placed in his hands "a coveted version of Philoponus, a thin folio in limp vellum, copiously underlined with blue and red ink." This visit seems to have been followed by many others, and Professor Baynes kept copious memoranda of the conversations on these occasions. During those years in Edinburgh, Professor Baynes translated the "Port Royal Logic."

In Hamilton's class-room, in the old buildings of Edinburgh University, the name of the most distinguished student of the year was inscribed in letters of gold on the wall, and I remember many years ago seeing the name of Spencer Baynes there, with many another name famous in the world of literature and philosophy. For some time Professor Baynes was on the editorial staff of the *London Daily News*, at that time at the height of its reputation, and a series of notable articles came from his pen, dealing with the American Civil War, his sympathies being, it may be added, with the North. In November, 1864, he was inducted by Principal James David Forbes to the Chair of Logic and Metaphysics in the University of St. Andrews. The Professor at that time was also required to lecture upon English Literature. Few men could be regarded as qualified to discourse on two subjects not closely connected, but Professor Baynes was as thorough a master in literature as in mental philosophy, and the academic duties were thoroughly to his taste. When he went to St. Andrews, the University had just lost the great Ferrier, claimed by some as the only genuine metaphysician that Scotland has produced, at any rate in modern times, and Flint had suc-

ceeded to the vacant chair; Lewis Campbell had taken Sellar's place as Professor of Greek, and John Campbell Shairp was Professor of Humanity, or Latin. In the chair of Mathematics William Fischer was the successor of John Couch Adams. Above all, was Principal John Tulloch, orator, churchman, historian, divine, one of the most commanding figures in the long line of Scotland's ecclesiastical leaders, Vice-Chancellor of the University and Principal of St. Mary's College. If the academic circle into which Professor Baynes was thus admitted was choice, brilliant, and distinguished, St. Andrews' society outside was no less notable, and as Mrs. Oliphant has said, "all these things tended to make the ancient little city the pleasantest and brightest of abiding places." It was a self-contained University centre with no outside affiliated institutions hanging on to it and vulgarising it, and no Carnegie endowments pauperising its intellectual feasts, and into that charmed circle of scholars, scientists and philosophers, Professor Baynes entered to become for over twenty years one of its brightest and most genial members.

On a later page reference will be made to the literary work accomplished by Professor Baynes, but the encyclopædia is his main achievement, not only because of its massive character, and its world-wide importance, but because it is a new departure, a work planned on principles not applied so completely to any previous encyclopædia. It takes its place indeed as the last link in a long, and ancient, and honourable line of encyclopædic literature, preserving as it does the formal features and arrangement of previous editions.

A glance at the great encyclopædias of the past will serve, perhaps, to bring out the point upon which I have laid special emphasis, and to show that the Ninth Edition was a new departure, as I have said, that its editor slavishly followed no predecessor, and that its excellencies and special features owed more than is generally estimated to the gifted and scholarly editor himself.

The original home of encyclopædias is generally held to be Alexandria; but China appears to have produced comprehensive summaries of human knowledge of greater antiquity and of more colossal proportions than any in the more western centres, and has indeed continued to do so down to our own time, for the British Museum received a copy, in 1878, of a Complete Thesaurus of Literature, Ancient and Modern, (the Kin Ting Ku Kim Tu' Shu tsih Ch'eng) published at Pekin, and consisting of no less than

5,020 volumes, which took forty years in preparation. The maps, plates, plans, &c., are said to be most elaborate ever prepared, and strangely enough, only one hundred copies were issued. I omit Dictionaries as such, though the Oxford Dictionary is really an encyclopædia, the vast extent of which may be judged from a recent volume which covers only Gre to Gyz, and includes no less than 4,238 words, an indication of the almost hopeless endlessness of the task commenced by Dr. Henry Bradley and Dr. J. A. H. Murray. Even such works as Leslie Stephen's Dictionary of National Biography begun in 1885, and occupying nearly twenty years in its issue, or the ambitious Encyclopædia of Geography, begun seventy years ago by Hugh Murray with the assistance of Sir W. J. Hooker, Professors Wallace, Jameson, and others, do not stand in the true line of encyclopædic descent. Aristotle, with his 38 separate treatises, and Theophrastus and others of the ancients, aimed deliberately at being encyclopædists. Theophrastus it was, who first described frictional electricity, as a property of amber. Later, Varro with his 88 volumes, and the elder Pliny with 37 books on Geography, Zoology, Medicine, Magic, &c., assumed the same rôle, as may be gathered from the title of Varro's lost work "Rerum humanarum et Divinarum Antiquitate." But these early savans, with compilers like Stobæus, Suidas, and Marcianus Capella, were less pioneer encyclopædists than the Arabian Al-Farabius, whose MS. in the Escurial at Madrid is said to cover all that was known of the Mathematics and Physics of the time.

In the Middle Ages the old classical aim was still pursued and ponderous treatises testified to ambitious efforts to embrace all human knowledge in voluminous theses, in which a grain of fact was often hidden in a whole acre of imagination and conjecture. The "Speculum Majus" of the Dominican Vincent de Bevais—dated about the middle of the 13th century, is a typical example, and its 10,000 chapters, sub-divided alphabetically, and covering History, Science, Dogmatics, Divinity and Ethics, are prophetic of our modern encyclopædias. The "Summa Theologiae" of Thomas Aquinas is the most famous encyclopædic compilation by a single author, and its orderly arrangement, its countless chapters and sub-divisions, almost strike one with awe, epitomising, as it endeavours to do, all earthly knowledge, and much material that is not and never was knowledge at all. In the mediæval monastic schools the "Summa" of Aquinas was the

great text book, and by some religious orders is still regarded as authoritative. Worthy of note is a work by an English Franciscan, Bartholomew de Glanville "De Proprietatibus Rerum" published in 1360 and long popular in John Trevisa's translation, dated 1398. We may well be amazed at the courage of those who thus attempted to concentrate universal knowledge, even though such knowledge was limited in extent, as compared with its vast range now; but no one can pore over the imposing folios of these distant times without feeling awed by their laborious patience and diligence. I pass over such famous works as John Bale's ponderous "Index", published at Ipswich 1548, and republished at Basle in 1557, or Peter Heylin's Cosmographie, the Chorography and History of the whole World, in four books (published 1574), as well as Bacon's immortal "Novum Organum Scientiarum" 1605. The encyclopædia of Johan Alstedius, of Weissembourg, dated 1630, however, deserves mention as it defined the term itself in the following words: "Encyclopædia est systema omnium systematum quibus res homine dignæ, methodo certa explicantur." The work was in seven volumes, and a later edition appeared in folio in two volumes. Cornelli in 1696, projected in Venice, an encyclopædia, the "Galeria de Minerva" in 45 folio volumes, but like many a similar venture it was never completed, only seven volumes appearing. In 1703 there was published anonymously an English Universal Dictionary, Historical, Geographical, Chronological and Classical, in two volumes, but it can hardly rank as an encyclopædia, any more than Dr. Harris's Lexicon Technicum or Universal English Dictionary of the Arts and Sciences, in two folio volumes (1706 and 1710). Zedler's great Universal Lexicon, 64 volumes, occupying eighteen years in publication (1732–1750) merits little notice as the matter is inferior excepting for some interesting genealogies. The Cyclopædia of Ephraim Chambers, 1728 is a remarkable production, and it not only passed through five editions (each two large folio volumes), but it is notable as furnishing the basis for the famous Encyclopédie Français. The Abbé de Gua, there is good ground for holding, had Chambers' volumes before him, for it had been translated into French, as well as into Italian and other languages, and when the Encyclopédie passed from the Abbé's hands into those of Diderot, D'Alembert, and the other great encyclopædists, it is rather remarkable that they specifically mention Chambers's production, but with a very patently assumed

contempt. It was a case of kicking down the ladder which had led to their own great achievement. In spite of the fame of the contributors, Rousseau, Voltaire, Montesquieu, Buffon, and others, the story of the publication has some petty and humiliating features about it. A quarrel arose with the publisher, M. Breton, before publication, and on the issue of the Encyclopédie it was found that all the trenchant attacks of Diderot and his confréres upon the church and political opponents, had been pruned down, and their sting and satire had all been extracted. Baron de Grimm's correspondence tells of the dismay of the Encyclopédists when they discovered that their iconoclastic efforts had been so subtly frustrated. Nevertheless it was an epoch-making work; and half of Europe, it has been said, applauded, while the other half denounced it. About the end of the century (1790) there quietly appeared, in London, Rees' Cyclopedia in 47 volumes quarto. It was a most erudite and, even now, valuable work of reference, its author being a learned Unitarian clergyman, Dr. Abraham Rees. The handsomely printed volumes may often be seen at second-hand book stores, a stately pile of quarto volumes, containing a vast mass of succint and reliable information compiled by a laborious scholar. Like the wonderful Penny Cyclopædia (published by the Society for promoting Useful Knowledge, under Lord Brougham's auspices), Rees' Cyclopædia was a great work, and ranks high in that kind of literature. About this time appeared Good and Gregory's "Pantologia," embracing as the title page states, "a complete series of essays, treatises, and systems alphabetically arranged" by Dr. Good Mason, an American, Dr. O. Gregory, London, and Mr. Newton Gregory Bosworth, of Cambridge. It was in 12 volumes with beautiful engraved plates. From 1782 to 1832 the Encyclopédie Methodique was in course of publication, this great French work extending over 201 volumes; but it was rivalled at any rate in slowness of issue by the vast Allgemeine Encyclopädie of Ersch and Grube which began in 1818 and is, I believe, still in course of publication —the 108th volume appearing in 1888 seventy years after the first volume.

During the 19th century, encyclopædias in England followed each other in quick succession, the London Encyclopædia, 22 volumes, in 1824, the Penny Cyclopædia, already mentioned which was issued in 28 volumes, small folio, and later by Charles Knight under the new name of "The English Cyclopædia" and

in 23 volumes, of which the first appeared in 1854 and the last in 1862.

It was in four divisions: Geography, Biography, Natural History, and the Arts and Sciences. Sir David Brewster's Edinburgh Encyclopædia and Lardner's Cyclopedia are less remarkable, but the Encyclopædia Metropolitana stands almost as a rival to the great "Britannica" itself. The first edition took 28 years to complete and its editors, three Church of England clergymen, Henry J. Rose, Hugh J. Rose and Edward Smedley, counted on their staff men no less notable than Airy, Babbage, Coleridge, De Morgan, Cardinal Newman, the Herschels, F. D. Maurice, Whewell, Whately, and others. Its 32 volumes consist of 23,000 pages of text and 600 plates, and cost, exclusive of paper and actual publishing, no less than $220,000. It was re-issued in a second edition in 1849 under Coleridge's editorship. Coleridge prefaced it by his famous essay on the Doctrine of Method, a piece of brilliant but utterly futile ingenuity, the basis upon which he attempts to methodize all human knowledge into a system, being wholly artificial and fanciful. The famous Edinburgh publishers, the Messrs. W. and R. Chambers brought out, in 1860, their valued encyclopædia. It was in ten volumes and occupied eight years in publication (1860–1868). A second edition appeared in 1888, and improved revised editions have from time to time been issued, the contributors including some of the ablest of the younger authorities in the various branches of knowledge.

Amidst this voluminous stream of encyclopædic literature the Encyclopædia Britannica appeared at first somewhat obscurely, and its three modest quarto volumes, issued in 10c, or rather sixpenny numbers, little foreshadowed the ponderous and imposing volumes which now stand as the world's great standard work of reference. William Smellie was its first editor and it consisted of abridgments of special articles compiled, as the prospectus states, by a "Society of gentlemen in Scotland," one of whom was James Tytler, brother of William Tytler, of Woodhouselee, who wrote a notable work on Scottish music, and published James First's famous poem "The King's Quair," two and a half centuries after it was written. Smellie it may be mentioned was the author of a Natural History, now forgotten. Twelve years later a second edition, expanded into ten volumes (8,595 pages) appeared, and unlike the first edition, it included biography and history, but metaphysics and ethical philosophy were ex-

cluded, the main contents being summaries of the various sciences. The prominence given to science drew down upon the Encyclopædia the denunciation of the literary world, Gray saying that such works were a very unfavourable sign of the age, while Pope pronounced their authors "blockheads". Fourteen years elapsed before a third edition was ventured and, in 1797, eighteen volumes were issued comprising 14,580 pages and 542 plates, and now including articles on philosophy, metaphysics, etc., though it still was published in cheap numbers and afterwards bound in volumes. Such was the growth of its popularity that over 13,000 copies were sold in weekly parts and the publisher is said to have realised about $210,000 by the edition. In 1810 a fourth edition in twenty volumes appeared, in which the mathematical articles by Professor Wallace were important, and the help of foreign authors was enlisted for the first time in some of the more abstruse subjects. Arago and Biot wrote dissertations for the supplement of the fourth edition. The fifth edition was merely a reprint of the fourth edition; but in 1824 six supplementary volumes were published, in which three long reviews or dissertations appeared, on great subjects, a feature which has been retained in all subsequent editions. The sixth edition was simply a reprint of the fifth though the editor was a capable man, viz. Professor Mackay Napier. A supplement was issued and included articles by such men as Dr. David Irving.

Now the work passed from Constable and Co. into the hands of Adam and Charles Black, who have published it ever since and the seventh edition (1830–1842) under Professor Napier was issued in an enlarged and improved form to which previous editions could not compare. Dr. Irving is said to have written no less than twenty-seven articles, including biography, Jurisprudence, Canon, Civil, and Feudal Law, an indication that of the staff of contributors, numbering one hundred and sixtyseven, many wrote upon a variety of diverse subjects. The ambitious nature of the edition may be judged from the fact that more than $540,000 (£108766) was expended, of which the editor received $32,500 (£6500). Nearly five thousand copies were sold of the seventh edition. In 1860, the eighth edition appeared, having occupied seven years in its publication. It was disappointing in many most important respects. It is true that Archbishop Whately, Sir John Herschel, Professor Edward Forbes, and other leading authorities contributed, but the editing was most unsatisfactory,

recent articles jostled alongside brilliant up-to-date treatises and the work was very unequal and behind the times. Critics at the time referred to its antiquated tone. Dr. Gregory's article on Chemistry was obsolete, Dr. Traill's on "Heat" was lamentably weak, while the summaries of Zoology and Astronomy were beneath contempt. Looking over the volumes of the Eighth Edition its wordy antiquated style is most apparent, and where the articles are not wholly out of date they have no tone of authority; they are unequal, often incomplete, and as "the man in the street" would say they are good enough for an encyclopædia.

Here was an opportunity—here a chance for an editor, competent for his task, and ambitious and fearless to do it. The enterprising publishers found in the quiet and ancient University of St. Andrews just the man—a man widely known in the literary and philosophical world, more as a friend and scholar than as a writer of books—a man of vast encyclopædic knowledge—a man with high ideals, of great mental grasp and thoroughness, and possessed of the most kindly and genial of temperaments. Professor Spencer Baynes, in his profound technical treatise on the abstruse logical problem "the quantification of the predicate" (entitled "The New Analytic of Logical Forms") which he had written while with Sir William Hamilton, had shewn his calibre. The essay referred to has been pronounced to be the only original treatise in the field of pure logic produced in Britain, and ranking with the greatest German or French contributions to logical science. Professor Baynes's exceptional literary powers were seen in the many articles which he had published in the best serial journals of London and Edinburgh, while his masterly editorials in the *London Daily News* during the American Civil War showed his grasp of affairs of the time. He wrote innumerable anonymous papers on the language of Shakespeare, on English dialects, and various other literary subjects.

To *Fraser's Magazine* he contributed many articles, and for a number of years was a constant writer for the *Edinburgh Review*, the high position of which he did much to sustain, in the eleven or twelve articles which appeared in its pages from 1868 to 1874. His translation of the "Port Royal Logic," while a minor piece of work, is extremely valuable for the mass of notes at the end of the volume, notes which range over a very wide field, historical, literary, and philosophical, and indicate a familiarity with abstruse learning of a very exceptional kind. The last piece of

literary work, in which he took part, was in behalf of the red-gowned students of St. Andrews to whom he was so devoted and for whom they in turn felt no ordinary affection. He was co-editor with Professor Lewis Campbell of a charming academic publication, issued in connection with some college celebration, and died while the booklet was passing through the press. I quote, from the preface, by Professor Campbell, a few words of touching and eloquent testimony to the personal worth and charm of Professor Baynes as a man, a Professor, and the students' hero:—"Our little 'toy-book'* required only the completing touch of my co-editor, when he was suddenly taken away from this and from weightier cares. He ever followed the things that make for peace—and he is now at rest. His eulogy will be said and written elsewhere; here one thing shall have special record. He was the idol of the students, and they never had a truer, worthier friend. Of late, with a sort of prescience, they had singled him out for their applause. Wherever he went, he was the universal favourite of old and young. Urbanity, *bon-homie*, human kindness, unfailing cheerfulness, faithful comradeship, inalienable affection—many such terms rise up in thinking of him. But on reflection they are all summed up in Goodness. He was one of the best men whom many of us have known." John Skelton, the well-known Edinburgh writer (more widely recognizable perhaps under his pseudonym of 'Shirley') echoes the same high estimate when he says: "Of all the men I have known, Thomas Spencer Baynes was (I am tempted to use a word frequently misused) the most saintly. I knew him intimately for nearly forty years .....and I can say with confidence that his friendship was one of those 'mercies' for which I am most grateful; and for which I never cease to return thanks. To have known him was not a liberal education only, it was that, and more. After being with him a little, one came to comprehend what self-sacrifice and renunciation meant. Not that he was an ascetic; far from it, he had a keen enjoyment of life, and a hearty welcome for whatever tended to sweeten and beautify it; but his greatest happiness, at whatever cost apparent temporary cost to himself, was to serve a friend. In his pure idealism, in his quest after the true and the good, in the absence of all self-seeking, he was the Galahad of our society." He was, "Shirley" adds:—"One of the most scrupulous and chivalrous of men. He was never weary in well-doing

* Alma Mater's Mirror. Constable, Edinburgh, 1887.

in true sympathy, in unaffected kindness. He was very keen, satirical, intellectually incisive.....but he was one of those rare characters, which, in the best sense, are without guile". These words are not empty praise, or, at the most, merely generous expressions of esteem, they are less than the truth, as I can testify who was associated with Professor Baynes, as student, as Professorial assistant, and as friend, for several years before his death. A more strenuous and constant worker, a more thorough and accomplished intellect, a more genial, almost jovial, yet tender nature, I never knew, though, during those last seven or eight years of friendship, the shadow of death was hovering about him

> "Lo! Death stood in the garden walk,
> And peered into the room."

He knew that his bodily trouble might end fatally at any moment, yet (and I must quote from "Shirley" again) "His spirit was so intrepid, so indomitable, that he never lost his habitual cheerfulness—he looked at the dread shadow that haunted him with an eye that kept a pleasant, I might say, a humourous twinkle to the last." I remember the hearty cheers, with which the students greeted him, on his return to the lecture room after a somewhat perilous illness on one occasion—"It is almost worth the pain of being ill" he said, beaming with geniality, "to receive such a welcome as that, gentlemen." And, on I believe the last occasion at which he was present at an academic function in the old University which he so nobly served, I remember he laughingly remarked to a group of students:—"Still daylight, gentlemen" as he emerged from the College hall after a very lengthy lecture on "John Major, a XVIth Century Scottish Logician," by a verbose Edinburgh advocate, which had occupied almost a whole winter afternoon in its delivery. This unfailing humour and geniality made the Logic class-room far less forbidding than to most students the technical nature of the subject would have rendered it. Rarely a week passed that some amusing incident did not occur to enliven the routine of metaphysical and logical disquisition, and Professor Baynes too keenly relished the comic to discourage the occasion, when it arose.

The St. Andrews' undergraduates' pleasantest recollections were associated with the old logic class-room, one of the few fragments of the mediæval buildings erected by Bishop Kennedy about the middle of the fifteenth century.

When I first met Professor Baynes he was immersed in the stupendous work of editing the Ninth Edition of the Encyclopædia Britannica. Between the issue of the first volume in 1875 and the last in 1888 thirteen years elapsed; but for many years prior to 1875 he had been labouring at the scheme which should make his edition unsurpassed. Selecting and engaging the contributors, completing the scheme of publication, and carrying through all the endless details of editorship—in this case the editorship of a work without a peer—had already told seriously upon Professor Baynes' health, when I became a student of his in 1882. From 1883 to 1887 I was more or less constantly in his home, and especially in his study, and much of our conversation, apart from academic work, referred to the "*magnum opus.*" So thoroughly did Professor Baynes do his duty as editor that every one of the 1140 contributors, most of them leaders in their various branches in the English-speaking world, realised that a high standard was aimed at, that in the editorial chair was a man of vast sweep of intellectual range—a profoundly versed encyclopædist, in truth—and that every article must pass a searching ordeal or it would be rejected. Hence, unlike every preceding edition, inferior articles are not sandwiched in amongst masterpieces, but every article is the best, it may be said, of its kind, and in many cases will continue to rank as able and authoritative expositions. For the merit of much of the work, which passed under Professor Baynes' critical eye is, that it is not abreast merely, but frequently in advance of the generally-accepted state of the science. I know that in perhaps the best Biological Laboratory in the world, the Balfour Laboratory at Cambridge, England, the various articles on Biology were bound separately and used as hand-books by the ablest workers, along with special monographs, when engaged in researches. When I was an advanced student at Cambridge they were regarded as ahead of the best text-books of the time. The articles on Philosophy, Theology and Biblical learning were similarly regarded by scholars—the best proof being that some of the contributors were, like the authors of "Essays and Reviews" twenty years earlier*-under the ban of heresy, indeed, one contributor, Professor Robertson Smith was actually tried in Edinburgh, as I have already said, for his articles on Isaiah, and he left the church (Free Church of Scotland). Professor Baynes laid down the inflexible rule that each article must be

* The famous Essays and Reviews published in 1860.

original, and must be no mere compilation, at the same time it must embody the most recent and reliable results of research. In previous editions second-hand compilations, out of date before they were printed, appeared alongside brilliant expositions by eminent authorities. Crude personal views or peculiar scholastic ideas, like Mansel's "Nescient Philosophy" in the eighth edition, were prominent, but no editor so rigidly as Professor Baynes excluded singular and peculiar views, or mediocre and well-worn contributions. Even the index, a piece of formal routine labour, one is apt to imagine, was entrusted not to an inferior writer but to an eminent scholar, one no less eminent than the late Principal John Cairns. A contemporary said of Cairns that he was one of the few men who read through the twenty-five large volumes, and brought his vast stores of knowledge into requisition in preparing that most necessary supplement to any worthy work, an adequate index. It had been commonly thought that an encyclopædia was not the best vehicle for a specialist's exposition, still less a book for specialists to consult, indeed Coleridge says in the prospectus of the Encyclopædia Metropolitana that such a work "neither is nor can reasonably be considered as the book which a profound man of science is likely to consult for those things in which he is himself eminent." It is, however, specialists who have most appreciated the Encyclopædia summaries of their departments. Professor Baynes for the first time proved that both needs, those of the general public and those of specialists, could be met in one great compendium. Yet he kept out mere speculation, which becomes old and discredited, frequently before the ink becomes dry. Even the famous "Challenger" report included speculations, which were antiquated, or rather rejected, before the last volume was completed. The masterly editing of Professor Baynes rendered this impossible. I doubt if even now, and the first volume is thirty years old, any article can be strictly declared out of date—an evidence, surely, of skilful editing powers. It may be said that historical facts do not change—we cannot expect new contributions on old-established truths and principles. But the method of treatment can advance. The ninth edition showed that an able original writer can present a subject—no matter how venerable—in a picturesque and attractive manner. Professor Baynes disproved that common idea that the articles in an encyclopædia must necessarily be dry, by insisting on new articles in every case and disdaining the old. His standard was

so strict—no one, not even the most eminent writers, could secure acceptance of their articles unless approved after careful scrutiny. No other editor of the encyclopædia would have dared to reject articles by men of world-wide eminence—yet, the article on Burns by that brilliant Scotsman—(compared by some to Scott himself) —Robert Louis Stevenson, was put in the editorial waste-paper basket, as not fulfilling the conditions or reaching the standard imposed by the editor. Professor Baynes paid for the article on Burns, but it was returned to its author, and its place was taken by an account of the Scottish poet more in accordance with the character of the Ninth Edition. Baynes was the utter reverse of a martinet. He knew, no one better, the literary greatness of Stevenson, for it was to his own intimate friend and colleague, Principal Tulloch, that all Stevenson's earlier productions were sent by his mother. Tulloch's judgment was invariably sought before Stevenson sent his contributions to the various magazines. Coleridge had criticised the editorial policy of former days, especially the license allowed under the "planless plan," he styled it, of encyclopædia editors universally, whereby "instead of a systematic history of the received truths and established discoveries in the department of knowledge, which was to have been exhibited, the larger portion of the space is filled up with the individual writer's own crude conceptions and prolix argumentation." Professor Baynes, in his modest editorial note, dated St. Andrews, June 1st, 1875, in the first volume of the original issue of the ninth edition—read doubtless by few of the tens of thousands of readers who consult the work—says "it has to do with knowledge rather than with opinion. Its main duty is to give an accurate account of the facts and an impartial summary of results in every department of inquiry and research." Those who knew Professor Baynes realized how onerous and how exacting the task of editing the encyclopædia would be in his hands—so scrupulous, so thorough—so critically unsparing, yet appreciative. One can hardly realise the weight of this herculean labour, and there is intense humour in the letter to Baynes Principal Tulloch wrote in 1876 when busy with a hundred public duties—University lectures, Scottish Education Board meetings, Church Assembly functions, literary work, and responsibilities at Balmoral Castle as Queen's chaplain. "I scarcely know what I am doing" he says but he added, in a fine spirit of banter, "You are a lucky fellow that have only got your 'Encyclopædia' to attend to." Tul-

loch knew what a task it was, and nothing grieved him more than to see his dearest friend sinking as he undoubtedly was, under the burden of editing the great work. His genial and brave spirit kept him up, and he actually survived his distinguished friend, the Principal, by about a year.

Few literary men have had so wide a circle of friends of the highest eminence. Professor Baynes' personal friendship with a wonderfully wide circle of men the most prominent in their various spheres in London, Edinburgh, Dublin, and other intellectual centres, specially fitted him for selecting the best writers. Long a life-member of the Athenaeum Club—called, if I am right, to the English bar early in life—sub-editor of the *London Daily News*, when that newspaper was at the summit of its high reputation, there was hardly a man eminent in Literature, Philosophy, Theology, Science, or Art, whom he had not met, and with whom he was not in most cases on the most intimate terms of friendship. John Stuart Mill, Herbert Spencer, Tyndall, Huxley, and a host of others were in his inner circle of friends, yet in selecting writers, he did not always choose men whose fame was already established and noised abroad. Indeed the Encyclopædia actually made the reputations of a large number of contributors to its pages. Professor Baynes' profound knowledge and unerring judgment is demonstrated by the brilliant names, which now justify his choice. A large list could be compiled of young writers whom Professor Baynes selected whose reputations the Encyclopædia created, so that they became thereby famed as authorities. That best known of living writers Andrew Lang, was little known, and wholly unknown as a metaphysician, when his article upon "Animism" appeared in the first volume of the Ninth Edition. He had a reputation as a polished classical scholar and dainty poet, but his encyclopædia article at once attracted attention as an able and original contribution, and his philosophical fame has grown, so that he was selected in 1888 as Gifford Lecturer at his old University of St. Andrews. His later work based on his Gifford lectures entitled "The Making of Religion" has established itself as a brilliant study of a profound subject. In some cases specialists were selected wholly unknown before but of whose qualifications Professor Baynes was aware. In some cases specialists of repute, but known only to specialists were chosen. I doubt, for example, if many readers of the Encyclopædia were familiar with the name of Professor W. C. McIntosh when the

article upon Annelids appeared. My own studies had been zoological from my early years, but I remember as a student feeling non-plussed when Professor Baynes asked me the name of the best authority upon the Annelids. "I have asked a Dr. McIntosh to write the article on that subject" he said to me. Strangely enough I became most intimately associated with Dr. McIntosh, who is known in scientific circles all the world over as the greatest living authority upon the Annelids. As a student, assistant, and, later, as collaborator, much of my professional career has been spent under that distinguished scientist's auspices. As a young naturalist I did not know of the great repute of my future teacher and master but Professor Baynes did. As a Shakespearean scholar Professor Baynes ranked high. His college lectures were remarkable for their erudite critical qualities, combined with the most impressive, indeed, imposing descriptive power. When treating a great tragedy like "King Lear" the spell-bound student-audience seemed to see not merely the play of human forces—the mortal on an earthly stage—but the very elemental powers, the immortal and undying forces of the universe exhibiting themselves on the stage of Eternity. In the English Literature course at St. Andrews numberless students had awakened within them for the first time an awe-inspired devotion to Shakespeare, which will last for life. Professor Baynes was the most impressive and fascinating lecturer upon English Literature whom I have ever heard, and I have listened to the best expounders of our time, including Masson, Arnold, Hutton, Morley and others. His article on Shakespeare is the only contribution in the Encyclopædia from his own pen, and it is one of the finest things ever written upon the world's greatest dramatist. Baynes was a worshipper of Shakespeare, and his students had many proofs of it, but Shirley's "Table Talk" affords one example—a letter from Baynes written in 1854 from which I make this extract:—

"When you come to town on your way west—I have a mask of Shakespeare's face that I want to show you. It is taken in plaster from the bust in Stratford Church, which Chantry believed to have been executed from a cast taken after death. However this may be, it is to me self-identifying—the authentic Shakespeare.....with a high, smooth oval brow, mild features, and a Grecian god-like calm upon the face—no strong individuality expressed, but infinite possibilities—the calm mirror of all individuality—the universal poet. This is given in the Stratford

mask more perfectly than I have seen in any engraving. I have no place to hang it up here, and, lying on the side-table, I can hardly tell you the strange effect it has in different lights. Above all at midnight—more than once, when on raising my head from a book, my eye has casually fallen upon it lying pale and still in partial shadow, the calm face has become as it were a presence, and I have been filled with a momentary awe in the consciousness that I was not alone. Positively the only ghost I have ever seen." From another letter I venture to quote, as it illustrates not so much appreciation of great art, as that intense humanity of Professor Baynes' nature, its almost womanly tenderness and susceptibility, which made him one of the most winning of academic masters, to the successive bands of students assembling year after year, from all parts of the British Islands:—"I went in for half an hour to the Royal Academy yesterday," he wrote to his friend John Skelton, "but, as I was almost too tired to stand, and did not stay long, I shall say nothing about it—save only this, that the face and form of that woman on the stairs of the burning house are—if not as I am disposed to think, beyond all—quite equal to the best that Millais has ever done, not forgetting the look of unutterable love and life-deep yearning in the Huguenots. And those children—ah me!—I can hardly bear to think of it yet; the agony is too near, too intense, too awful, for present rejoicing, even at the deliverance; and that smile on the young mother's face has struggled up from such depths of speechless pain, and expresses such a sudden ecstacy of utter gratitude and over-mastering joy, that it quite unmans you to look at it. It is the most intense and pathetic utterance of pure human love I have ever met with." The same note of profound emotion one finds in much of Professor Baynes' correspondence, witness this written on Xmas Eve 1860, "Nine years ago my sister, with whom I had grown up, died. How earnestly we look into the darkness, and ache over the mystery of death, and how vainly. .....It is Christmas Eve, and I am here alone in my room. I am not much given to days and seasons, but there is something hallowed and gracious in the time, and it is good to be alone and fill an evening hour with thoughts of the absent.....Let me send you, dear S...., across the frozen land lying white beneath the stars, the best wishes for a new year."

When Principal Tulloch died in 1886, Professor Baynes decided that a biographical account should appear in the volume

then passing through the press, and from his own pen, and a worthy and beautiful appreciation it would have been, but health forbade, and in September, of the year mentioned, he wrote to Skelton "I have been rather exercised in mind as to the notice of our dear friend Tulloch for the Encyclopædia. At first I had thought of attempting it myself, but I have virtually relinquished this; and you naturally occur to me as one of his most intimate lifelong friends, who would be able to do justice to his character, position, and especially to his historical and literary labours." A few days later he wrote (Sept. 22nd 1886):—"I am delighted to think that there is a prospect of your undertaking the work. What you say of the difficulty of sketching the Principal's character is most true. The charm of a personality so large and vital, so strong and tender, so manly, and yet so exquisitely sympathetic and humane, is not easily conveyed to others who never saw his face, or heard his voice, or felt his noble presence." In his college lectures, as in his letters and published contributions to current literature, Baynes's choice language and masterly descriptive power are notable. Here is a passage from one of his letters exhibiting this exquisite descriptive faculty:—"I have not here" he says, writing from his old home near Taunton, Somerset, in Feb. 1855," the sea, as you have in the north, but I have all the glory of the midnight heaven—the unveiled moon, the clear depths of the frosty sky, and the winter stars glittering like gems amidst the leafless boughs. I am continually struck afresh with the refined beauty and power of the winter landscape."

There was something mysteriously attractive about the personal appearance of Professor Baynes, "Tommy" as the students irreverently but with genuine affection, called him. Just over the middle height, rather broadly, squarely, built, with a noble head, high brow, silver hair, wavy, and slightly drooping over the massive forehead, the nose well-formed and aquiline, a somewhat military grey moustache, closely trimmed beard, small mouth always ready apparently to smile, and the whole countenance classic and dignified, lighted up by bright transparent blue eyes which never ceased to twinkle with quiet humour and kindly geniality, his was an attractive, impressive personality. There was a tense appearance about his high Greek brow, which caused students to often remark, that "Tommy's" forehead threatened to burst with the burden of its intellectual contents. His voice was tender and sympathetic, full of power and moving profundity

and resonance, thrilling his hearers when probing the depths of the Great Bard's overpowering tragedies, or rousing intense mirth when dealing with such lighter themes in his literature course, as Chaucer, Lydgate, or Sir David Lyndsay. In his academic robes he was a dignified and impressive figure, moving with an old-time stateliness, and yet never shewing even a tendency to austerity or over-bearing authority. He filled his pupils with a reverence almost approaching awe, and the order maintained in the "ancient Logic Class-room," was hardly equalled in any other lecture room in the University, yet in many respects the genial Professor made it the brightest and most attractive, in spite of the student's innate hatred of Logic and Metaphysics. Rarely a day passed as I have said that some comic incident was not fully utilized by Professor Baynes to relieve the tedium of the day's tasks. Often in the midst of some penetrating exposition of Thales or Locke or Hamilton, there would be heard the mournful but thrilling blast of a local baker's trumpet announcing his daily delivery of bread, and Professor Baynes would stop with an irresistible twinkle in his eye, and remark that Thales or Locke or Hamilton must give way to the baker's trumpet-tongued philosophy of bread. At other times dogs fighting in an adjoining wynd or the City Crier's drum would interrupt the lecture in like manner, and give occasion for witty sallies. I have been privileged in the course of a somewhat varied academic and scientific career, to know an exceptional number of notable men, men refined cultured and noble, men of vast learning; but I do not recall one that precisely filled the niche which Professor Spencer Baynes so splendidly filled. If the Ninth Edition was unique, and unsurpassed in all the long line of encyclopædias, he is unique and alone in the choice company of the world's encyclopædia editors. He was a gifted scholar and critic, one of the most encyclopædic of intellects—scholarly and exact yet full of genial human nature, large-hearted and sympathetic—an all-round man, in every sense. In my daily personal contact with Professor Baynes I had many opportunities of realising what unsuspected stores of knowledge he possessed. His Shakespeare scholarship, his profound acquaintance with Breton and early Norman literature and with Anglo-Saxon, and with mediæval Latin letters was very unusual. He was a metaphysician and a logician of uncommon powers, and even of biological and physical science he had an exceptional knowledge. Once discussing with me the functions of the brain and the views of Dr. Noble of Man-

chester, of Maudsley, G. H. Lewes and others, I was surprised at his minute acquaintance with the most recent physiology; and was no less surprised on another occasion at his familiarity with mediæval natural history, for taking down from his library shelves a copy of the Historia Naturalis of Johannes Johnston* (I by good fortune became possessed of a copy of that rare work recently) I was struck with his intimate knowledge of its voluminous contents, for he called my attention to a passage describing some Australian animals (*e. g.* the Ornithorhyncus) which he had difficulty in accepting, for Australia was not explored till Captain Cook's voyage of 1770, though Dutch navigators sighted Cape Leeuwin in 1627, and I was thus led to discuss out-of-the-way zoological matters with him. I was able to establish the fact that the descriptions applied to South American animals not Australian. One instinctively felt in his presence that he was like Decker or Heywood, among the Elizabethan giants, the bosom companion of great men, one who to pursue the similitude, could tell of "things done at the Mermaid." He had the old-time reverence for books, and would say with Milton "as good almost kill a man as kill a good book. Who kills a man, kills a reasonable creature, God's image; but he who destroys a good book, kills reason itself." He had the old reverence for great names, for immortal geniuses—he would utter the very names of Shakespeare, or Chaucer, or Milton, or Tennyson, with a tone of reverence—it was an education to young men to sit at the feet of so great and so gracious a master.

If, I repeat, the Ninth Edition of the Encyclopædia Britannica is one of the most amazing products of 19th century literary effort—the biggest book since the beginning of the world, hyperbolically exclaimed a well-known Montreal literary critic—if it is the climax and flower of encyclopædic literature—the greatest (without question) of the Britannic Encyclopædias—the credit belongs to the editor. Professor Baynes was one of the greatest of editors, I do not hesitate to say, and to his supreme intellectual qualities the exalted character of the Ninth Edition of the Encyclopædia Britannica is directly due.

* Published in Amsterdam in 1678.

EARTHQUAKES.

By Otto Klotz, LL.D., F.R.A.S.

[*Read March* 1, 1907.]

Destructive and calamitous as has been the San Francisco earthquake, yet from the scientific standpoint it has given a decided impetus to the study of seismology, and it has hastened the day when our knowledge of the interior of the earth will be of a definite character, which it is not now, if we except the comparatively few feet that we have penetrated into the earth.

Nature is an aggregation of facts, and it is the sphere of the investigator to correlate these facts and to explain their existence. In the effort to solve the latter advancement is generally gained by the method of elimination.

As facts do not generally admit of mathematical analysis, theories and hypotheses are advanced for their explanation. These temporary fortresses must then be able to resist the relentless cannon of observations and of criticism, for the enemy gives absolutely no quarter. Error succumbs to the first broadside; plausibility turns away many a shot and can stand a long siege. It serves a good purpose in permitting the enemy to reinforce its resources to keep up the attack until either the fortress is razed or a new one has been built within, built with the impregnable nickel-steel armor of truth.

Perhaps a brief review of some of the reasons assigned as the cause of earthquakes, leaving out those of supernatural origin, may not be unprofitable.

We know that there are many sedimentary deposits or formations constituting part of the crust of the earth. We know that they are more or less soluble. We know that the immediate crust of the earth is intersected and traversed by subterranean water-courses. We know that these waters when brought to the surface are more or less charged with salts—such as lime or sodium—dissolved from the formations through which the water passed. Now let us put two and two together. If a subterranean stream discharges so many cubic feet of water per day, and each cubic foot contains so many grains of lime, how long will it take

to carry away so many tons or cubic miles of limestone rock? The result of our investigation is a hole in the ground, or rather a hole in the earth, and if we make that hole big enough, something is going to happen—the roof is going to collapse—and we have an earthquake. This in brief is the Einsturz or downthrow theory. Now some earthquakes have happened which might be explained by the above, but, for, by far the larger number, other reasons must be sought. Before dismissing the above, it may be suggested, that, although subterranean waters must and do hollow out the earth's crust, the formations slowly adjust themselves to the minute changes continuously wrought by the action of water, so that excessively large cavities are improbable if not impossible.

One of the oldest beliefs about earthquakes is their intimate associations with volcanoes. This opinion died a hard death, in fact, I am not sure that it is quite dead yet, however Professor Milne has shown, especially for Japan—the principal earthquake country—"that the many quakes of that archipelago seemed to show an avoidance of the volcanic centres which are numerous in the interior and to indicate that volcanic energy was seldom concerned in generating them."

Volcanoes are as a rule shallow-seated, while the movements of earthquakes are tectonic, that is, affecting large areas of the earth's crust and miles in depth.

Another theory that was advanced some forty years ago was the tidal theory. Assuming the earth to be a molten mass covered by only a thin shell, it seemed plausible to have tidal effects by the attraction of the moon and of the sun. Spring and neap tides in the ocean would be manifested by earthquakes of greater and less intensity; similarly for perigee and apogee. However, facts don't fit in right, and the fortress has been abandoned.

When we say that earthquakes are the result of the adjustment of strains and stresses within the earth, the statement is one practically accepted by all seismologists, at the same time, it is far from explaining the cause. What sets up these strains and stresses, and if there are various agencies at work, what is their relative effect?

It is almost axiomatic to assume the earth as a cooling body. Now on this assumption a very pretty scientific theory was advanced some thirty years ago by Lowthian Green, it was the tetrahedral theory of the figure of the earth. Let us follow it for

a moment. Starting with the earth as a molten mass, we have a sphere as the result of the action of gravity. If we revolve the sphere we obtain an oblate spheroid, with flattened poles—orange-shaped, the shorter axis being the one of revolution.

The angular velocity of rotation being uniform and constant the whole body would be in stable equilibrium. If now any force or forces are brought into play to disturb this equilibrium strains and stresses are set up, and a counter tendency to relieve these strains is called forth to restore equilibrium. It is at this juncture that the property of the tetrahedron comes into play. Taking as our principal disturbing force of our supposed liquid or molten spheroid of revolution, that of dissipation of heat or cooling process, we find that the crust or shell of the earth tries to adjust itself to the stresses set up by the contracting body, and does so by the line of least resistance, that is, by spreading the stresses over the greatest surface, with the result, that the tendency of the surface of the earth is to assume the tetrahedral form, *i.e.*, of an equilateral pyramid. Or one may say that the contracting earth changes into that form whereby the original superficial area is maintained. For equal surfaces the volumes of the sphere and tetrahedron are to each other as 1:.55; and for equal volumes the surfaces are as 1:.1.45.

Neither the theory nor its advocates gives us a four-cornered earth, its original condition and axial rotation would prevent that, but the theory does claim that the tendency however slight or great in effect, must be towards shaping the surface into that of a tetrahedron, or tetrahedroid, the latter having curved surfaces or edges. If a complete transformation from the sphere to the tetrahedron took place, which is of course impossible, we would have, taking the axis of the earth co-incident with an axis of the tetrahedron through one of its apices, a north polar sea, which is the case; three great equatorial oceans; a south polar land cap, which too is the case; and there would be six grand mountain ranges, three diverging from the south pole, corresponding to three edges of the tetrahedron, and the other three encircling the northern hemisphere, being along the remaining three edges of the pyramid.

In the tetrahedron every corner has a surface opposite to it, so that for the earth this would mean that land and water are antipodal, which is fairly well represented in the actual conditions. Another result would be that land masses would be broad in the

northern hemisphere and taper towards the south, which too agrees with our geography. Inversely, the oceans should contract towards the north, a condition fairly well borne out.

Furthermore, the north polar area being represented by a surface and the south polar one by a corner, it would follow that the flattening of the earth in the southern hemisphere would be less than in the northern; and again, gravity would increase less rapidly towards the south pole than towards the north pole. Both these considerations have been confirmed by geodetic and pendulum observations.

If the tetrahedral theory was effective at the early stage of the earth's existence, in giving us many of our mountain systems and our polar physical conditions, to-day with a pretty rigid crust its effect must be vanishingly small and unrecognizable as due to that theory.

We may refer to another theory of the figure of the earth, contained in a paper presented by J. H. Jeans to the Royal Society in 1902. This theory shows, under certain assumptions, that the earth was pear-shaped at a certain stage of its existence, and contracting assumed the spherical form. I cannot in this place pursue this subject of the figure of the earth any further; it was only alluded to to show one of the factors—the contracting forces, ever active, whereby strains and stresses are set-up, and without which no earthquakes are possible.

Fisher in his "Physics of the Earth's Crust" 1889, combats the theory of mountain building as being due to the secular cooling of the earth and the accompanying contractions, but this would not preclude smaller motions to which earthquakes may be relegated. Arrhenius considers the crust of the earth comparatively thin; at a depth of about 40 miles to merge into a hot fluid mass, the magma, due to the increasing temperature. From the deepest boring on the earth the increase of temperature is about 1°F. for 51 feet, or say 100°F. per mile. Beyond a depth of about 200 miles the magma assumes the gaseous form. He writes "the earth as well as the sun contracts, whereby heat is envolved and the contraction partly arrested or decreased. Nevertheless the earth slowly shrinks. This pertains especially to the interior of the earth, for the temperature of the surface is almost wholly due to radiation from the sun, and in a small degree upon the character of the atmosphere. It may be assumed that, broadly speaking, the radiation of the sun and the nature of the atmos-

phere are constant. It follows therefore that the crust of the earth will not follow the shrinking of the interior. Foldings and wrinkles will be produced, and it is the general conclusion, that this is the principal reason for the uplifts of the surface into mountain chains."

That earthquakes are due to an adjustment of stresses in the earth's crust is admitted by all investigators, but on the cause of the stresses, there is far from unanimity of opinion.

Although some earthquakes are due to downfalls, and local ones to volcanic eruptions, yet for the great majority another reason or reasons must be found. Of the latter, the contracting force, already alluded to, is the one first to suggest itself, and has for its support at least great plausibility. It has been combated by able investigators, without however being able wholly or satisfactorily to dispose of it completely.

Leaving out of consideration the earth as a cooling or contracting body, let us picture to ourselves the earth at any time in a state of perfect equilibrium, there being no stresses on its surface nor in the crust. Let us note the physical features, the heights of the mountains, the faulting and folding of the rock formations, the depths of the ocean and the distribution of land and water. Now let the atmospheric influences come into play—rain and snow, heat and cold—together with the varying atmospheric pressure. The pre-existing equilibrium will be immediately disturbed; the water, as ripples, creeks, rivers and streams will begin its work of erosion and denudation; heat and frost will assist in the disintegration of mountain masses, and the ocean beds adjoining the continents will be loaded by enormous amounts of detritus carried from the land. Unless there is a continuous and simultaneous adjustment of the change of pressure, the stresses set up will be cumulative and continue so until they exceed the limit of elasticity, when rupture must take place to restore equilibrium for the time being. Rupture would necessarily be accompanied by earthquakes.

It is obvious therefore that meteoric or atmospheric influences are capable of setting up stresses on the earth's surface. It is safe to say that the whole surface of the earth is in a constant tremor due to stresses. But besides the general condition, there are other factors that come into play, and localize in a measure the seismic disturbance. These are mountain masses and ocean depths, especially if they are contiguous.

Speaking generally, mountains are not masses resting upon the surface of the earth, but must be considered as masses immersed in the earth, just as an iceberg is immersed in the water. The greater the part that projects above the water, the greater must be the part beneath the surface, for the amount of water displaced must be equal to the floating mass, otherwise there would not be equilibrium. Somewhat similar it is with the mountains. Were they resting on the surface, the stresses set up by the superimposed mass would not only be enormous, but would be greater than the crust could support. Furthermore as a superimposed mass it would materially affect the force of gravity in the adjoining region. The most noted investigations of this question was with reference to the attraction of the Himalayas in connection with the Great Trigonometrical Survey of India. Pendulum observations have shown conclusively both in India and in America that this is not the case. However complete equilibrium or isostasy does not obtain, and hence the residual strains and stresses.

It is obvious how through meteoric agencies cycles of changes are produced. The mountains by decrements are wandering seaward, the continents are lightening, and the ocean bed is being loaded, producing a deep-seated inflow from the sea towards the land. These changes are continually taking place, the earth's crust and surface are undergoing constant transformation, however minute; the strains and stresses are continually responding to one another; vast rock formations that seem rigid are by the slow process of time bent and contorted as if made of wire. But when these responses are not synchronous, when there is a lag, equilibrium can only be restored by rupture. This rupture will be along the line of least resistance, and this is generally found in a geological fault, an old rent in the crust, so well illustrated in the California earthquake of last April.

If the earth were a homogeneous body or if at least it were composed of concentric shells each of homogeneous matter, then the geodetic surveyor when carrying on large trigonometric surveys would not be troubled with closing errors, other than those arising from observations. There would be no error due to deflection of the plumb line. As complete isostasy does not however exist, these observed discordances, due to the unsymmetrical distribution of matter, are a measure of isostasy.

Dr. J. F. Hayford has examined the data furnished by the

triangulation of the United States, and has found 71 miles as the most probable value for the depth of compensation, that is, the depth at which the compensation of the excess of matter at the surface (continents) by defect of density below, and of surface defect of matter (oceans) by excess of matter below is complete. At and below this depth the condition as to stress of any element of mass is isostatic, that is, any element of mass is subject to equal pressure from all directions as if it were a portion of a perfect fluid. From this it appears that the behaviour of the magma, situate beyond 71 miles, is that of a liquid.

As earthquakes are so intimately bound up with stresses, we quote Hayford: "In terms of stresses it is safe to say that these geodetic observations prove that the actual stresses in and about the United States have been so reduced by isostatic adjustment that they are less than one-tenth as great as they would be if the continent were maintained in its elevated position, and the ocean floor maintained in its depressed position, by the rigidity of the earth. It is certain that for the United States and adjacent regions, including oceans, the isostatic compensation is more than two-thirds complete, perhaps much more." Hayford's result is one of the most brilliant mathematical deductions in geodesy and geophysics in recent years.

Several causes have been adduced which contribute or may contribute to the production of earthquakes. In investigations one is sometimes led to the discovery of widely different phenomena, which, however, synchronize with each other, thereby raising the question whether one is dependent upon the other, or whether both phenomena depend upon a common cause. Such a case is the possibility of a connection between latitude variations and earthquakes. On this point Professor Omori, one of the foremost of seismologists, says: "From an examination of the mean monthly values of the latitude of Tokio, I have found that all the destructive earthquakes of recent years in Japan occurred exactly or very nearly when the latitude was at a maximum or minimum."

Verily our solid earth is only so in a Pickwickian sense. The surface slides bodily over the figure of revolution, our excursions in latitude being about 26 feet. On solid rock we make marks as reference points, unalterable as we think, for levels and other measures,—the earth heaves but a sigh and our basal points lose their value. In despair almost we exclaim "Is their nothing stable on this earth?"

I shall now refer to three notable earthquake—the one in Canada in 1663, the one of Jamaica in 1692 and the one of Lima in 1746, and shall give a few extracts from original sources. The extracts are perhaps more adapted for a study in ethics than of science.

In the Jesuit relations the great earthquake of 1663 is frequently referred too, but unfortunately the descriptions are so wild and exaggerated that very little scientific value attaches thereto, outside of the statement of its extent, and inferentially, I think, one can locate the fault or rift where the main displacement or adjustment took place.

Lalemant writes under date Sept. 4, 1663: "An earthquake extending over a region more than 200 leagues in length and 100 leagues in width, making 20,000 leagues in all, has shaken this whole country, and caused us to witness some prodigious transformations. Mountains were swallowed up; forests were changed into great lakes; rivers disappeared, rocks were split and their fragments hurled to the very tops of the tallest trees; thunders rumbled beneath our feet in the womb of the earth, which belched forth flames; doleful and terror-inspiring voices were heard; while whales and porpoises bellowed in the waters; in short, all the elements seemed aroused against us, and threatened us with the direst disaster.....It made itself felt from Isle Percée and Gaspée, which are at the mouth of our river, up to Montreal and beyond, as also in New England, Acadia and other far-distant regions." The earthquake happening on the Monday eve, Feb. 5, preceding Shrove Tuesday, had a salutary effect in preventing debauches commonly occurring on that day, "thus Shrove Tuesday was fortunately changed into a Good Friday and also into an Easter."

"They saw very lofty hills striking together with brows opposed, like headstrong rams, then suddenly and instantaneously swallowed up in the yawning of the earth."

Father Charles Simon relates "that a man so shuddered at the sudden earthquake, although at other times he was brave, that his hair, bristling up with horror and standing upright, shook off his fur cap."

The following extract appears to furnish some proof that the adjustment and principal movement took place along the bed of the St. Lawrence where our geologists of to-day have placed "The Great St. Lawrence and Champlain Fault," extending from

beyond Anticosti along the channel of the St. Lawrence to the vicinity of Quebec and thence by a gentle curve to Lake Champlain: "It may be very easily inferred how great was the upheaval of the earth, from the fact that such and so great a river changed its color, not for a brief space of time, but for eight entire days, put on a sulphurous one, and kept it constantly; for, from the bowels of the earth, agitated in their nethermost depth and poured into it, and from sulphurous mines, its waters were diluted with an abundance of liquid sulphur." The earthquake lasted with ever increasing intervals until the following September.

Coming to the earthquake at Port Royal, near the present Kingston, Jamaica, on June 7, 1692, the Anglican minister there writes the following week (15 June): "Captain Ruden's house upon the first concussion sunk into the earth, and then into the sea, with his wife and family, and some who were come to dine with him.....I saw the earth open and swallow up a multitude of people, and the sea mounting in upon us over the fortifications .....the earth working all the while with new motions and tremblings, like the rowlings of the sea.....I found the sea had entirely swallowed up the wharf, with all the goodly brick houses upon it, most of them as fine as those in Cheapside, and two entire streets beyond that.....In the space of three minutes, about half an hour after eleven in the morning, Port Royal..... was shaken and shattered to pieces, sunk into and covered, for the greater part by the sea, and will in a short time be wholly eaten up by it.....We guess that by the falling of the houses, opening of the earth and inundations of the waters, there are lost 1,500 persons.....Our great and famous burial place was destroyed by the earthquake, which dashing to pieces the tombs, whereof there were hundreds in that place, the sea washed the carcasses of those, who had been buried, out of their graves. .....From St. Ann's we hear of about 1,000 acres of woodland changed into the sea, and carrying with it whole plantations. .....Whole streets (with inhabitants) were swallowed up by the opening earth, which then shutting upon them, squeezed the people to death. And in that manner several are left buried with their heads above ground; only some heads the dogs have eaten, others are covered with dust and earth by the people who yet remain in the place, to avoid the stench.....The two great mountains at the entrance into 16-mile walk fell and, meeting, stopt the river.....At Yellows, a great mountain

split and, falling into the level land, covered several settlements, ...One person had his plantation removed half a mile from the place where it formerly stood, and now good provisions grow upon it." Of the same earthquake Dr. Morley "takes notice that he had felt several lesser shakes, and heard the noise often, which is very loud, and by those not used to hear it, may be easily taken for a rustling wind, or hollow rumbling thunder, but he says it hath some puffing blasts peculiar to itself, most like those of a brimstone match, when lighted, but in a much greater degree, and such as a large magazine of brimstone may be supposed to make when on fire. He adds, that in Port Royal, and many places all over the island, much sulphurous combustible matter had been found, supposed to have been thrown out, upon the opening of the earth, which upon the first touch of fire would flame and burn like a candle." In this earthquake at Port Royal the shore line subsided 26 to 48 feet beneath the sea.

In the same year, 1692, possibly synchronizing with the preceding Jamaican quake was the severe one at Riobamba in the province of Quito, South America.—"It shook the earth in such a manner that it bore off great pieces which were seen to run entire three or four leagues from the place where they had been before, and thus to remove whole fields, with the trees and houses standing. This event occasioned the most extraordinary law-suits that were ever heard of, brought to Lima, to decide to whom these estates belonged: the party on the one side alleging that they were within his jurisdiction or lordship, and the other pleading that he was upon his own land."

This is the most pointed reference to law-suits resulting from earthquakes that I have come across. I think we must take the sliding about of the country nine to twelve miles with a grain of salt.

Imagine Ottawa waking up some fine morning to find itself up at Aylmer or Chelsea!

Coming now to the great earthquake of Oct. 28, 1746, in Lima, I shall quote a few sentences from the volume of the following year describing the catastrophe: "But it is most certain that the two main principles of these dreadful mischiefs are heat and moisture.....However, supposing such to be the case, it does not at all hinder but, that the Almighty-Power may employ these natural accidents as the instruments of punishment to a wicked people.....There was not before the late great

calamity a more licentious spot upon the earth. The charming serenity of the climate and fruitfulness of the country, the plenty of all things, and the sedate tranquility which the Spaniards perpetually enjoyed, these, together with the extreme beauty of the women, did not a little contribute to an amorous disposition, which was the prevailing passion of the inhabitants."...."Lima, being subject with very little intermissions, to such dreadful calamities, one would imagine it was the habitation only of criminals sent thither for punishment, or of the people who were weary of life, and not of such who made it their choice to live there. But so powerful are the allurements of riches, so bewitching the hope of gain, as to make danger preferable to safety, and the continual fear of death reconcilable with the desire of living long and out of harm's way.....Of all judgments, proceeding from natural causes, which the Deity often inflicts on offenders, in order to satisfy divine justice and manifest his almighty power, the unexpected stroke of sudden earthquake hath ever been the most tremendous, for as much as in one and the same moment they became both the warnings and executioners of its wrath.... ....This fatal catastrophe befel the place thirty minutes after ten at night, when the sun was in five degrees ten minutes of Scorpio, and the moon in not much less of Taurus, so that these planets wanted very little of being in opposition, as they actually were in five hours and twenty-two minutes afterwards, an aspect which by constant observation hath proved unfortunate in this climate; for under its influence these convulsive kinds of agitation in the earth do most usually happen.....On this occasion the destruction did not so much as give time for fright, for at one and the same instant almost, the noise, the shock, and the ruin were perceived together, so that in the space of only four minutes, during which the greatest force of the earthquake lasted, some found themselves buried under the ruins of the falling houses, and others crushed to death in the streets by the tumbling of the walls, which, as they ran here and there, fell upon them.....The earth struck against the edifices with such violent percussions, that every shock beat down the greater part of them."

"Of a total of about 3,000 houses within the city walls, scarce twenty were left standing, and of the estimated population of 60,000 only 1,141 were killed. The small loss of life is due largely to the one-story buildings." The seaport of Lima, Callao, with a population of 5,000 was wholly destroyed by a tidal wave accom-

panying the earthquake; only about 200 escaped. Ships were thrown high and dry over Callao.

In reading the descriptions of these old earthquakes one cannot but perceive a certain mental attitude of the people towards the phenomenon, and that attitude may best perhaps be expressed by saying with Shakespeare "Conscience does make cowards of us all."

The San Francisco earthquake so fresh in your minds, and which has been so much described and illustrated, will be dealt with briefly. The great mountain masses in California running parallel to the coast, and the adjoining ocean depths of the Pacific are conducive, as already indicated, to earthquakes. The break would naturally occur about midway between these depths and the mountains, and furthermore along the weakest line thereabouts, that is, along an old geological fault, as was actually found to be the case. The displacement of the surface adjoined this old fault or rift, which runs northwest-southeast in an almost mathematical straight line for several hundred miles. The nearer to this line, the greater was the displacement or earth movement. Along the rift the greatest horizontal shifting was $16\frac{1}{2}$ feet, the western side moving northward, while the eastern side moved southward. The maximum vertical motion was about 4 feet.

It may be mentioned that our Ottawa Observatory seismograph registered the arrival of the first tremor or shock seven and a third minutes after its occurrence, which is equivalent to a speed of transmission of 340 miles per minute.

The disturbing force varies probably inversely as the square of the distance from the rift, but as far as destruction to buildings is concerned it depends very materially too on the nature of the ground upon which the building stands. This was well illustrated at San Francisco, where the earthquake damage was almost exclusively confined to made or alluvial ground, that part of the city that had been reclaimed from the tide flats. This is an important point and one that will not be forgotten in future construction in earthquake areas.

The Kingston earthquake of last January, although more destructive of life than the San Francisco one, yet as a world-shaking phenomenon was very much smaller than the California one of last April, for the minimum amplitude or swing of the recording instrument at Ottawa was nearly twenty times greater for the latter than for the former. Earthquakes are generally

judged by their destructiveness to man and his works. This depends on how near or close a city or habitations are to the rift, where the greatest shaking takes place. Earthquake instruments are, however, oblivious to man or his toy works, they record simply the working of mother earth; so that the great earthquakes of the seismologist are not necessarily co-incident with the great earthquakes of man.

In the calamitous earthquake of Valparaiso last 16th August, it is reported that the harbor is now ten feet shallower than before that event, and that the motion was mostly vertical.

The most noted vertical movement of recent years was the Alaska quake of Sept. 10 and 15, 1899, when the uplift along the Yakutat coast for upwards of a 100 miles was many feet, reaching its maximum in Disenchantment Bay where the land rose 47 feet.

The last quarter of a century stands out pre-eminently as the most marked in seismic disturbances of which we have any historic record. It began with that cataclysmic explosion of Krakatao in 1883, noted for the red sunsets that followed for the next two years, due to the suspended dust in the upper regions of the atmosphere. Of the important disturbances we may mention those of Ischia near Naples; Tarawera, New Zealand; Charleston, South Carolina; Mino-Owari, the climax of the many thousands of shocks in Japan; Alaskan coast already referred to; Saint Pierre in the West Indies; Formosa; Vesuvius; and the recent quakes at San Francisco, Valparaiso and Kingston. It is estimated that the loss of life resulting from these disturbances is at least 150,000.

The question naturally occurs, whether we in Canada have much to fear, or even anything to fear from destructive earthquakes. Speaking generally, I say no, and this especially for eastern Canada bordering the Atlantic; for we have there not that marked contrast of mountain masses and ocean depths, and our St. Lawrence with its long chain of settling basins in the great lakes carries comparatively little suspended matter to load the ocean bed to produce stresses. When, however, the question is asked, should a severe earthquake happen, where will it most likely occur? Then we are pretty safe in predicting that it will occur along our weakest part of the crust of the earth, and that is, along the Great St. Lawrence and Champlain fault, following the lower part of our ocean stream, already described as the line of the great quake in 1663. As a matter of fact we have more

trembling down there now, especially in the vicinity of Eboullement, near Murray Bay, than elsewhere. As an earthquake risk for any of our large cities, Quebec would have to pay the highest premium.

Should an earthquake visit Ottawa, the chance is remote, the Observatory would be more affected than the Parliament Buildings, for the former is within stone's throw of a line of weakness in the earth—the so-called Gloucester fault.

Time does not permit me to speak of earthquake instruments. I will simply say that one can not but marvel at their sensitiveness. They tell us what is going on in the earth when our senses are wholly unable to detect the slightest disturbance or movement. Whether the old earth heaves a sigh in its long struggle against the inevitable when *rigor mortis* will set in, be it in Japan or Italy, in Chile or Alaska, these silent observers, that literally have their ear to the ground, note the pulsations as they pass in their journey round the world. How gladly would the seismologist launch his little canoe on the seismic wave at the hypocentre or starting place, and just see whither and how fast the wave would carry him. There would be no harbor, no resting place, the course followed would be the one prescribed by nature,—following the line of least resistance. The log of such a journey has yet to be written, and when it is written we will know more about the crust of the earth, and of the interior than we do now.

P.S.—Since the above was written Professor T. J. J. See has sent me a copy of his paper "The Causes of Earthquakes, Mountain Formation and kindred Phenomena, connected with the Physics of the Earth," read Oct. 19, 1906.

Professor See is an able investigator. He devotes 140 pages in the Proceedings American Philosophical Society to expounding his theory. He dismisses all other theories and hypotheses as inadequate for the explanation of the phenomena indicated by the title of his paper. His own theory is that we have to turn to the explosive force of steam for satisfactorily answering the questions suggested above. On the last page he writes: "The great layer of water covering the earth which gives life to animals and plants, and in the form of steam is the greatest mechanical agent of man, when sunk into the crust becomes also one of his worst destroyers, on account of the explosive vapor generated beneath by the internal heat of the globe."

On p. 324 we read: "We thus seem compelled to abandon

the construction theory entirely, and to explain both peaks and ranges with their striking parallelism to the coast by upheavals occurring near the sea, due to the explosive power of steam, which has heaved up the mountains from beneath.....And lastly it shows that all mountains are alike inside, whether they burst open and become volcanoes or remain intact."

The same agency he advances for producing earthquakes and volcanoes.

This post-script is not the place to present and discuss the paper at length.

However, one is safe in saying that geophysicists and seismologists will not tacitly say amen, when Professor See exclaims "Eureka."

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